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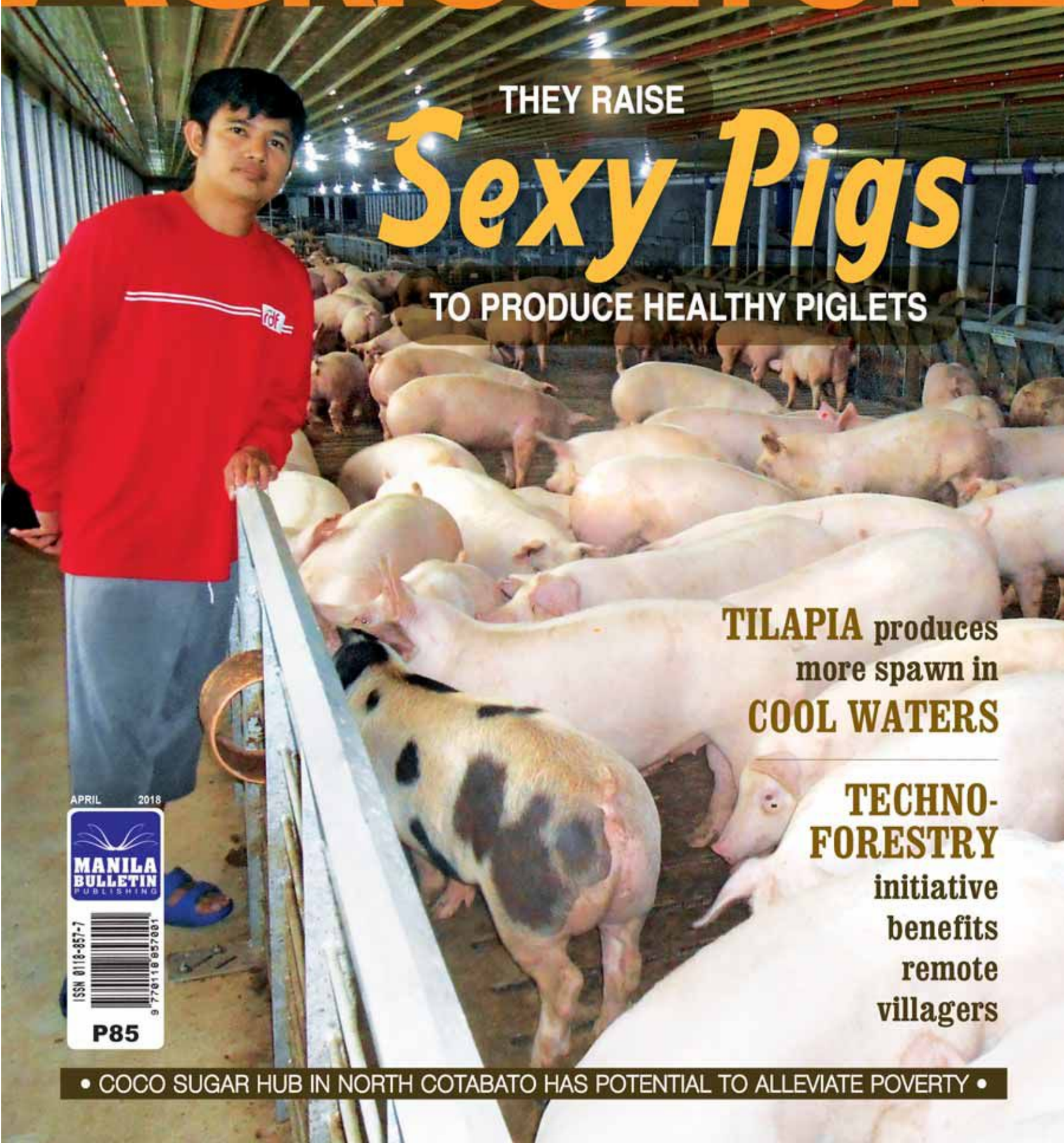
MONTHLY

AGRICULTURE



THEY RAISE Sexy Pigs TO PRODUCE HEALTHY PIGLETS

TILAPIA produces more spawn in COOL WATERS

TECHNO-FORESTRY initiative benefits remote villagers

• COCO SUGAR HUB IN NORTH COTABATO HAS POTENTIAL TO ALLEVIATE POVERTY •

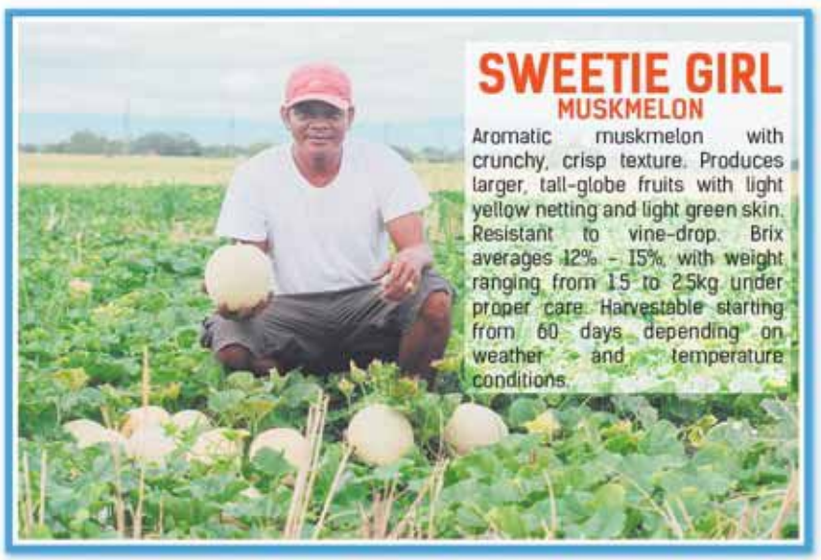
APRIL 2018
MANILA BULLETIN PUBLISHING
ISSN 0118-857-7
P85

BUFFALO
PAMBANSANG PAKWAN

Highly adaptable sugar baby type watermelon. excellent for large scale production. Produces black-green fruits with a rounded shape and red flesh. Brix averages 10%-12%, with weight ranging from 6kg to 12kg depending on fruit selection. Harvestable starting from 65 days depending on weather and temperature conditions.

DIANA
WATERMELON

Unique. Golden-yellow skinned oblong watermelon with a cottony, fluffy texture. Excellent for high-class markets. Brix averages 10%-12%, with weight ranging from 2kg to 4kg depending on fruit selection. Harvestable starting from 60 days depending on weather and temperature conditions.



SWEETIE GIRL
MUSKMELON

Aromatic muskmelon with crunchy, crisp texture. Produces larger, tall-globe fruits with light yellow netting and light green skin. Resistant to vine-drop. Brix averages 12% - 15% with weight ranging from 1.5 to 2.5kg under proper care. Harvestable starting from 60 days depending on weather and temperature conditions.

RED LADY
PAPAYA

Medium-dwarf red-orange fleshed papaya variety with high tolerance to Papaya Ringspot Virus. Subtly aromatic with excellent sweetness. Fruit weight ranges from 1.5kg - 2.5kg. Fruit can be harvested while immature for cooking purposes, or when ripening for fresh consumption. First harvest at around 6 to 8 months depending on weather and temperature conditions.

SUNFLOWER

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MONTHLY
AGRICULTURE

ATTY. HERMOGENES P. POBRE President & Publisher
ZAC B. SARIAN Editor
SAHLIE P. LACSON Editorial Staff

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A new shallot hybrid could be a big money-maker for onion growers. First commercial plantings in Ilocos show the excellent performance of the variety that uses seeds instead of bulblets for planting. Maserati, the new hybrid, produces bright red bulbs that are bigger than those of the ordinary "Lasona" grown in the Ilocos.

page **22**

Tilapia produces more spawn in cool waters. That's the finding of researchers from the Mariano Marcos State University College of Aquatic Sciences and Applied Technology. This is an important tip for those who want to go into commercial production of fingerlings for sale.

page **34**

There's a new product that can make your fruits sweeter. It is a liquid called Sweet Biostimulant formulated from plant extracts by scientists of Valagro, the leading producer of biostimulants in Italy. The fruits don't only become sweeter, they will also have improved skin color and longer storage life.

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ON THE COVER

RDF Pig Farm operations manager Dr. Ariel Peregrino with fattened pigs at the RDF Pig Farm in Floridablanca, Pampanga.

See next page for the story.

CONTENTS

FROM THE EDITOR

>BY ZAC B. SARIAN

BIG SWINE FARM RAISES SEXY PIGS TO PRODUCE HEALTHY PIGLETS

THE PIGGERY IS A MAJOR PLAYER IN A HIGHLY INTEGRATED AGRIBUSINESS THAT EMPLOYS 1,300 MEN AND WOMEN

WHEN DISCUSSING how Dr. Ariel Peregrino manages a huge piggery operation that boasts 2,000 sows to address the pork requirements of more than a hundred meat shops, restaurants, and other outlets owned by its mother company, it's easy to be impressed.

The mother company is the highly integrated RDF Feed, Livestock and Foods, Inc. established by Dr. Robert Lo, a veterinary doctor-turned entrepreneur. RDF stands for Red Dragon Farm, the name of his first company when he started as a contract grower of a big poultry integrator. The enterprise has since expanded to include a feedmill, poultry and swine production, meat shops (Fresh Options), restaurants, and other outlets.

The piggery is a major player in the integrated business and Dr. Peregrino has been tasked to be its operations manager. The setup is quite unique compared to other commercial

Dr. Ariel Peregrino posing with fattened hogs ready for delivery to the slaughterhouse.

Dr. Robert Lo is the veterinarian-entrepreneur who founded RDF Feed, Livestock and Foods, Inc.

piggeries. For one, the farm does not sell the piglets produced by the 2,000 sows. They are all fattened to be slaughtered then processed into a variety of meat products sold through the company's meat shops and restaurants. A breeding farm with 1,000 sows is found in San Jose, Tarlac and another in Magalang, Pampanga with the same breeder population.

Planning, forecasting, and coordination are very important in running the big piggery, according to Dr. Peregrino. Plans are made on a weekly, not monthly, basis. That's because months have different number of days whereas all weeks have seven days. Forecasting is also very important; it's to ensure,

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Dr. Peregrino with newly weaned piglets.

Floridablanca farm manager Jojo Dimaiwat posing with a big company-owned truck for hauling the fattened hogs.

Exhaust fans make the growing house comfortable for the pigs.

he says, you will know how to go about achieving your targets. Coordination with the other players in the integrated business is no less important because you have to be a team player.

FROM WEANING TO FINISHING – During a recent visit to the piggery's farm in Floridablanca, Pampanga, weanlings were observed prior to being brought there for fattening. A batch of 400 weanlings (four weeks old) were brought to a 400-square meter building equipped with exhaust fans, automatic feeders, and waterers. They stay in that building until they are ready for shipping to the slaughterhouse.

To produce the 400 weanlings, 60 sows are inseminated artificially at the same time on a Thursday. The female breeders are induced to come into heat with the help of hormones, Sixteen weeks later, they will give birth on a Friday. And 28 days later, the piglets will be weaned on a Saturday and brought to the growing and finishing house.

NO NEEDLE TEETH CLIPPING – The breeders, by the way, are confined in steel crates. In many other piggeries, the needle teeth of the piglets are clipped as soon as they are born to prevent them from damaging the teats of their mother.

At the RDF piggery, they don't clip the needle teeth. Aside from being laborious, clipping can sometimes cause infection. They have a way of preventing damage to the mother's teats. This is done by feeding the mother pigs frequently, say, six times a day. Dr. Peregrino explained that the sow will always stand when eating, and so the piglets don't suckle for long periods. This helps prevent damage to the teats. Not clipping the needle teeth is one way of avoiding stress in the piglets.

MINGLING THE PIGLETS - Another way of avoiding stress among piglets of different sows is to allow them

The silo where the feed is stored for automatic feeding.

Dr. Peregrino showing the controls of the computer system.

to mingle with one another as early as one week from birth. It is done this way: the mother pigs are confined in crates, each with a divider. On the seventh day, the divider of two crates is removed so the piglets will mingle and get familiar with one another. On the next week, the dividers of two other adjacent crates are removed so that more piglets will become friendly with one another instead of becoming aggressive. This, again, reduces stress among the piglets, which is good for their wellbeing.

SEXY PIGS - Did you know that sexy breeder pigs will produce better litters and that they will also have a longer productive life? That's another thing that can be learned from Dr. Peregrino. He said that a sexy breeder pig is one that is neither too thin nor too fat. It means that an eight-month-old gilt that is ready for breedding should weigh 130 kilos. That's the ideal weight of a sexy pig. On a scale of 1 to 5, the sexy animal has a body score condition (BSC) of 3.

Dimaiwat posing with fatteners in Floridablanca.

Three-month-old fatteners.

The growing pigs are at peace with one another, no quarreling because the room is very comfortable.

"Vegetarian" pigs ready for shipment to the slaughterhouse.

Lady vet Jezelyn Balajadia watching “Sexy Gilts” in the making.

Balajadia and farm manager Mark Cortez discussing the feeding regimen in the farrowing house.

Aerial view of the farm in Tarlac.

What happens if the pig weighs less than 130 kilos? Well, according to Dr. Peregrino, the body of the prospective mother pig will not have enough reserves come farrowing time. The animal will become thin quickly after giving birth and that is bad because it will have to be culled early. The condition can also

Gestating sow inside a crate.

Sows in gestating stalls are provided with individual records.

adversely affect the potential LSBA or “litter size born alive.”

IF TOO FAT - And what happens if the gilt is too fat, weighing more than 130 kilos at 8 months old? Well, they will eat more feed during gestation and that means they become more expensive to maintain. Usually, the fat breeders produce less milk for their litters.

On the average, breeding sows give birth 4.5 times before they are culled. But the objective at the RDF Piggery is to increase the longevity of the animals. Best performers can give birth eight times, says Dr. Peregrino. And how do you achieve that longevity?

GOOD START FOR GILTS - Aside from good nutrition, the gilts should have a good start that considers weight, age, and BCS. Good management during gestation and farrowing include prevention of lameness through hoof and leg management. Constant monitoring is also done as often as possible, including BCS through calipers, back fat through a Renco lean meter, and feed adjustment according to body condition. Feed adjustment can easily be done because the feed supply to the animal is controlled by computer.

Providing good housing (tunnel vent design) is also very important. The housing is provided with exhaust fans to control humidity inside the hog houses.

BIOSECURITY - Lastly, biosecurity is very important. All those who enter the farm observe very strict protocols to prevent the entry of disease organisms.

These strict protocols are apparent with a visit to the growing and finishing facility in Floridablanca. Before entering the premises, visitors have to take a bath and change clothes, into trousers and shirts provided by the farm. Camera bags, cellphones, and cameras have to be exposed to ultraviolet rays.

Visitors have to wear sandals provided by the farm then walk almost a kilometer to another point in the piggery where they change trousers, shirt, and sandals before proceeding.

In the grower-finisher house, the caretaker cannot leave the piggery until the hogs are harvested about five months later. After harvesting, the caretaker is given a two-week vacation. That's also a very important measure in the name of security.

VEGETARIAN PIGS – Another unique strategy at the RDF Piggery is that the fatteners are fed vegetarian feed. This means that the feeds given to the animals only contain proteins that are sourced from plants like soya and corn. There's no fishmeal and other ingredients from animals like bloodmeal or meatmeal. Why? Fresh Options, the meat shop chain of the company, is very particular about the flavor of the meats they sell. Using fishmeal and the like in the feed could impart some kind of fishy flavor ("*malangsa*").

The company has its own feedmill that supplies only the requirements of the piggery and the poultry farm. It does not sell its feeds to outside customers. That's why it can maintain the desired quality suited to each stage of growth of the animals.

Did you know that a breeder pig will consume one ton of feeds a year? For the 2,000 breeders alone, that is 2,000 tons a year. The fatteners require big quantities as well.

RDF Feed, Livestock and Foods, Inc. has come a long way from its modest beginnings in 1988. It has more than a hundred meat shops in Central Luzon and Metro Manila. Customers can buy fresh cuts, marinated, ready-to-cook, ready-to-heat, and other value-added meats. The company boasts of its own restaurants like Meats and Match, a hole-in-the wall type of food kiosk; Roberto's Coffee and Tea; Robbie's Deli in a Hurry; Hot Kitchen; and Chicken All Ways. The company has also generated a lot of jobs for Filipinos, directly employing 1,300 men and women.

Piglets about to be weaned.

Sow with 12 healthy piglets.

Piglets suckling on their sows.

With open crates, the piglets of two sows mingle and become friendly.

NEW HYBRID SHALLOT IS A POTENTIAL MONEY-MAKER

MORE THAN 200 FARMERS from towns in Ilocos Sur, Ilocos Norte, Pangasinan, and elsewhere witnessed the potential of Maserati as a moneymaker for farmers during the recent Allium Festival held at the farm of Jose Madriaga in Tay-ac, Bantay, Ilocos Sur. Maserati is a new shallot hybrid introduced only last year by Ramgo International Corporation, a pioneer in the vegetable seed business in the Philippines.

Beautiful Maserati harvest from a planter in Vintar, Ilocos Norte impressed the farmers for the big size of the bulbs and their intense red color, which are characteristics sought after by traders as well as consumers. At the same time, the attendees also witnessed the very excellent stand of the Maserati plants in Madriaga's farm which were 65 days old from transplanting during the event.

Close up of the beautiful bulbs of Maserati.

As per the harvest in Vintar, one square meter could yield as much as nine kilos, according to Madriaga. Bulbs of 15 plants make one kilo. Judging from the robust stand of Madriaga's plants at the time of the festival, he said he could harvest ₱120,000 worth of fresh bulbs, including the leaves, at only ₱20 per kilo from 4,000 square meters. During the Allium Festival, we learned that a kilo of Lasona, the local variety of shallot, was selling from ₱25 to ₱30 per kilo.

Because of the excellent performance of Maserati in Ilocos, many of the attendees said they will definitely plant the new variety in the next planting season, which could start next October after the harvest of rice. One lady government employee who planted the native Lasona this past season, Violeta Cabebe, said she will surely plant Maserati next time. Her lady companion whispered to us that Ms. Cabebe had sold her standing crop Lasona to a trader from Urdaneta City for a big sum. With Maserati, she can expect an even higher income.

Maserati is a hybrid that is planted with the use of seeds instead of bulblets as in the case of the ordinary Lasona. When seeds are used, the plants are healthy from the start because there is no infection of the planting materials. When bulblets are used, it is very possible that the planting materials are infected with disease organisms which could result in poor yield.

Madriaga sowed his seeds in a seedbed and transplanted the

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Ramgo's Fredelyn Vinoya is in charge of promoting onion crops in the North.

Jose Madriaga showing the tomatoes he intercropped with his Red Dragon onion.

seedlings when they were 28 days old with three leaves. Transplanting is easy at 4 inches between hills. After 80 days from planting, the bulbs are harvestable.

The Ramgo Team that collaborated with Madriaga in staging the Allium Festival was headed by Ramgo president Pamela Ong Chan. Other Ramgo personnel who were there included Arielina Arevalo, Venus Cariazo, Fredelyn Vinoya, Rachelle Reyno, Mary Faith Reyno, John Mark Trinidad, and Frevian Camba.

By the way, Madriaga is the barangay chairman of Tay-ac, which speaks well of his leadership. He is a creative farmer who implements techniques in farming that maximize the use of limited farm space to produce food and other

Madriaga in his Maserati field intercropped with corn as a relay crop.

Newly harvested Maserati.

Onion growers from Narvacan pose with Ramgo president Pamela Ong Chan at right.

Signage at the entrance of the festival.

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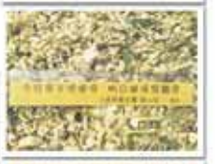


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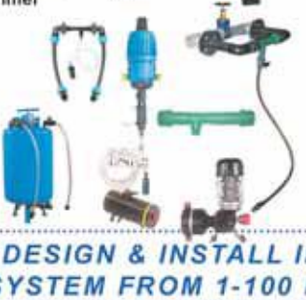

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A verry happy Pamela Ong Chan with newly harvested Maserati.

Madriaga holding a 65 day-old bulb of Maserati in his farm.

Madriaga also plants Superex onion, which is a favorite of fast-food chains.

Mr. and Mrs. Madriaga with Vinoya.

Madriaga has three tractors for mechanizing his farming.

agricultural products.

He grows vegetables and other high-value crops year-round. These include ampalaya, tomato, cucumber, okra, and string beans. By using irrigation pumps, especially during the dry months, he is able to produce different valuable crops for sale throughout the year.

RELAY CROPPING – One of his techniques to maximize his harvest from his farm is relay cropping. This is done by planting a new crop in a field with standing crop so that when the first crop has been harvested, the intercropped variety will take its turn to be productive.

One example is what he has done on his field planted to Red Dragon onion. When the onions were 50 days old, he planted tomato seedlings at appropriate distances in the onion plantation. When the onions are harvested about 50 or 55 days later, the tomatoes will already be starting to produce ripe fruits. Harvesting could last for 15 to 20 harvests. He has planted a very high-yielding tomato so that even if the price per kilo ex-farm is only ₱8, it is still profitable for him.

In his previous tomato planting, Madriaga said that harvesting can be done every day in a one-hectare tomato plantation, harvesting from just a portion at a time. In that previous crop, he was able to harvest 2,000 to 4,600 kilos every day. Even at ₱8 per kilo, the daily gross was substantial. For harvesting 2,000 kilos, he usually spent ₱1,500 for the harvesters. Aside from the harvest from the tomatoes, Madriaga says that by planting tomatoes between his onion plants, destructive insects are repelled.

In his standing crop of Maserati shallot, Madriaga intercropped yellow corn for livestock feed. At the time of our visit (March 1, 2018), when the onions were 65 days old, the corn plants were already 1 foot tall. Next May, they will already be ready for harvesting.

What is important in order to be able to practice relay cropping is that you have a way to irrigate your plants. Madriaga irrigates his onions every 9 days using a pump run by either electricity or diesel engine.

Now you see, you can maximize productivity in your farm by practicing relay cropping. Aside from tomato and corn, you can use many other varieties for relay cropping. **–ZAC B. SARIAN**

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BY JULIO P. YAP, JR.

SMALL FARMLAND YIELDS 7 TONS OF ONION

A FARMER was able to harvest at least 7.29 tons of red onions from his 3,500-square-meter farmland. According to Victor Layug, he was able to attain a bountiful harvest by efficiently spraying his onion plants with Amino Plus Foliar Fertilizer or APFF at least twice a week, depending on the weather prevailing in their area.

He says that prior to using APFF, he could harvest only about 4.5 tons of onion from his small farmland in Barangay Togatog, Bongabon, Nueva Ecija. During Layug's cropping season last March, he was able to harvest at least 243 net bags of onions, and each bag weighed about 30 kilos. He says that his harvest could be worth about ₱218,700 if he can sell his produce at the prevailing price of ₱30 per kilo.

As seen during a recent visit to Layug's farm during harvest time, the size of the bulbs and their intense color were impressive. He says that these are the characteristics which are sought after by the local traders and even consumers.

Based on the excellent performance of his yield, Layug says he will continue to use APFF during the next planting season, which is expected to start before the year ends. However, Layug stressed that he will be planting a better onion variety during the next planting season, like hybrid onions—which he has tested before—to attain a better harvest that he expects could give him an even bigger income.

Initially, Layug was hesitant to use APFF when Manny Pablo of Global Green Organic Fertilizer, Inc. introduced the product to him. But when he saw the results, he immediately sprayed his onion plants vigorously and regularly with it, which resulted in better yields.

According to Pablo, damage to agricultural crops due to weather disturbances could be prevented or minimized with the proper application of farm inputs like organic fertilizers and other related products. He says that plants sprayed with APFF are more resistant to diseases and other stresses in the field.

When sprayed, it effectively adheres to the plant's surface and provides quick supplementation. This is because APFF contains compounds that promote plant growth and does not contain toxic or carcinogenic materials; thus, it is a good source of fertilizer. It is high in L-Amino acids that are easily absorbed by plants. It also contains effective microorganisms that

Victor Layug (right) was able to harvest at least 7.29 tons of red onions from his 3,500-square-meter farmland in Bongabon, Nueva Ecija with the use of organic foliar fertilizer. He enjoyed a bountiful harvest after efficiently spraying his onion plants with Amino Plus Foliar fertilizer.

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In 2013, I started eliminating chemical fertilizers and pesticides in the production of vegetables. Having learned the risk and hazards of chemicals in the health of farmers, the consuming public and to the environment, I decided to go full-organic by producing my own inputs (vermicomposting and the production of bio-botanical extracts/concoctions).

As an Organic Demo farm and a Learning Center, with the assistance of the Department of Agriculture, I have trained students, teachers and private organic enthusiast in various aspects of organic farming. The common problem is that I run out of stocks of homemade inputs since my trainees usually buy them from me. Usually I can only prepare enough for my own requirement. This prompted me to look for commercially available foliar fertilizer that is 100% certified organic and registered with BAFS. I read about AMINO PLUS in the Agribusiness Magazine and gave it a try.

I immediately applied it to my seedlings and Pinakbet crops every 15 days. Amazingly, *mas dumami ang bunga ng kamatis, sili, talong, okra na naaplayan ng AMINO PLUS at mas mahaba ang pamumunga. Malalaki ang bunga ng Sweetcorn at mas madami yung tig- dadalawa ang bunga*. From then on, AMINO PLUS is already a common ready stock in my fermentation cabinet augmenting my homemade inputs.

-ROGELIO M. BALISACAN
Agape Organic Farm and Learning Center
Brgy 25-S, Sitio Panunggalan,
Payao, City of Batac

Top Photos: Harvest from Mr. Rogelio's Farm

Bottom Photo: A lecture on organic Nursery management to K-12 students in Agape Organic Farm Learning Center

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Layug says that cultivating onion can be easy, but to have a good yield, one must practice cultural management practices and the right amount of fertilizer should be provided. During the most recent cropping season, Layug harvested at least 243 net bags of onions, and each bag weighed about 30 kilos.

Manny Pablo of Global Green Organic Fertilizer, Inc. introduced APFF to Layug.

have long-term beneficial effects on the physical, chemical, and biological condition of the soil.

Layug says that cultivating onion could become easy, but to have a good yield, proper cultural management practices and the right amount of fertilizer should be provided.

High production costs due to the increasing costs of commercial fertilizers is one of the main problems of small scale farmers like Layug. But Pablo says that one way to solve this problem is to apply organic fertilizers like APFF. Application of organic materials can also prevent erosion of the soil, cracking, and crusting. It can also help retain soil humidity and improve soil's internal drainage. He added that crops fertilized with organic matter can have greater resistance to pests and diseases.

The humus acid and growth substances are absorbed into the plant tissue through the roots and they favor the formation of proteins by influencing the synthesis of enzymes that will increase the vigor and insect resistance of the plant.

The weeds growing in Layug's farmland were immediately removed by hand-pulling to keep the area clean and to avoid forcing his crops to compete with the weeds for nutrients, water, sunlight, oxygen, and other factors that can affect the growth and development of the onion bulbs.

Layug was able to prevent armyworms, locally known as harabas, from damaging his crops by applying Nordox 75WG micronized fungicide regularly. He related that the crops of the others farmers near his farm were already being attacked by armyworms, but his onion plantation remained almost pest-free due to the use of Nordox because it is a micronized copper fungicide which provided protection to his plants. Nordox is certified by the IMO and OMRI as organic, like AFPP, which is also certified organic by the Organic Certification Center of the Philippines (OCCP).

Layug was able to prevent armyworms or "harabas" from damaging his crops by regularly applying Nordox 756WG micronized fungicide to his plants. His onion plantation remained almost pest-free.

Layug claims that his onion is sought after by local traders and consumers due to its characteristics.

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SENATE BILL 1533

BY ALLAN MAURO V. MARFAL

BALIK SCIENTIST ACT APPROVED IN BICAM FINAL READING

THE BALIK SCIENTIST ACT that will give more incentives to returning Filipino experts, scientists, inventors, and engineers is expected to be enacted into law next month. The Act, also known as Senate Bill 1533, was approved in the third and final reading at the Senate and House of Representatives during the Bicameral Conference last March.

DOST Secretary Fortunato T. de la Peña (front row, center) poses with the principal authors of the Balik Scientist Act: Senator Paulo Benigno "Bam" Aquino IV (front row, left) for the Senate and Bohol second district representative Erico Aristotle C. Aumentado (front row, right) for the House of Representatives during the recent Bicameral Meeting at the Senate of the Philippines in Pasay City. Also in photo are (standing, from left) Party List Rep. Salvador B. Belaro Jr., Sen. Maria Lourdes Nancy S. Binay, and Representatives Arlene B. Arcillas of the first district of Laguna, Edward Vera Perez Maceda of the fourth district of Manila, Divina Grace C. Yu of the first district of Zamboanga del Sur, and John Marvin "Yul Servo" C. Nieto of the third district of Manila.

Senator Paulo Benigno Aquino IV, principal author in the Senate, shared that both Houses are expecting President Rodrigo Roa A. Duterte to sign the Act into law within the next two months. His Lower House counterpart is Bohol second district representative Erico Aristotle C. Aumentado.

"Upon transmittal of all the documents to Malacañang, which will take few weeks, then in 30 days if there is no veto message, we expect that he will sign this and it should be a law by April or May. I don't see any reason for the President not to approve this law. We all know that he would like to see all greatest Filipino minds to stay in the country to contribute to economic development," said Senator Aquino.

The Balik Scientist Act seeks to institutionalize the Balik Scientist Program of the Department of Science and Technology (DOST), which encouraged some Filipino scientists to return and contribute to research that will help address development gaps in the Philippines.

Under this bill, a returning scientist can enjoy various compensations that include: tax and duty exemptions on the importation of professional equipment and materials; free medical and accident insurance covering the award period; reimbursement of expenses for baggage related to scientific projects; and even exemption from "renouncing their oath of allegiance to the country where they took the oath."

Aside from that, a Balik Scientist can also participate in DOST's Grants-in-Aid research and development. A grant may be provided to the Balik Scientist and released through the host institution for the implementation of the project in accordance with relevant

government regulations and the needs of the program involved.

The benefits also include special working and non-working visas, round-trip airfare from a foreign country to the Philippines, exemption from local travel tax, and DOST-subsidized visa application.

Also under the bill, long-term Balik Scientist awardees can enjoy relocation benefits, such as support in securing job opportunities for the spouse of the awardee, and admission support for the children of awardees in preferred schools, relocation allowance and monthly housing or accommodation allowance, and funding for the establishment and development of a facility or laboratory.

DOST Secretary de la Peña explains some of the provisions needed for the Balik Scientist Act with Senator Aquino IV and Senator Binay during the Bicameral Meeting at the Senate.

"Institutionalizing the Balik-Scientist Program of DOST is one way of showing that we recognize the importance of our scientists and engineers abroad, especially on how their knowledge, expertise, and experience could help a lot in order to address some of the pressing problems of different areas in the country, particularly in the urban part," said Sen. Aquino.

Sen. Aquino also shared that Sec. de la Peña has been supporting this bill for years, since he was an undersecretary of DOST.

"It is very crucial to strengthen the Balik-Scientist Program of DOST because we have areas that lack experts. Examples are space technology and artificial intelligence, which are just starting. It is very crucial to have enough human [resources] in these fields to help us in conducting various research and development projects," said Sec. de la Peña.

Under the bill, a non-bachelor's degree graduate who has extensive experience in important fields can be also considered a Balik Scientist and apply for the program.

The bill also states that the Balik-Scientist Program will prioritize experts in the fields of space, technology, artificial intelligence, biomedical engineering, energy agriculture and food technology—biotechnology, information and communications technology, pharmaceutical, disaster mitigation and management, environment and natural resources, electronics, genomics, health, manufacturing, nanotechnology, cyber security, and semiconductors. **(DOST-STII)**

BY REYNALDO E. ANDRES

TILAPIA PRODUCES MORE SPAWN IN COOL WATERS

CURRIMAO, ILOCOS NORTE – Tilapia produces more spawn in cool than in warm water. Thus, it is necessary to provide their environment and breeding ponds with shades to increase fingerling production.

A shaded tilapia pond in Dingras, Ilocos Norte set up by MMSU CASAT researchers.

This was the recommendation of Dr. Veronica Grande and Prof. Marjorie Ramos, researchers of the Mariano Marcos State University (MMSU) College of Aquatic Sciences and Applied Technology (CASAT) in this town to tilapia farmers who may want to produce more fingerlings for commercial purposes.

Known as aquashade technology, this simple method was developed by Grande and Ramos to help increase the supply of fingerlings and meet the increasing demands of the tilapia industry.

The researchers said that the shading technology is effective in the summer season when the temperature of the pond is above 32 degrees Celsius. If raisers can lower the water temperature to at least 28 to 30 degrees Celsius, they could produce more spawns, up to 77.3 percent more than those being raised in non-shaded breeding ponds.

Meanwhile, hatchery-bred tilapia fingerlings are the main source of good quality stocks for public and private fish raisers who have large-scale aquaculture businesses in the country. However, one of their problems is the high temperature of water ponds during summer that leads to low spawn production.

Research done by MMSU CASAT experts show that tilapia cannot produce the desired volume of spawns if their environment exceeds 28 to 30 degrees Celsius. In some instances, waters in inland ponds cannot attain this stable temperature because of the inclement weather conditions brought about by the adverse effects of climate change. This usually happens at the start of the dry season, which is from November to May, a mating season for most freshwater fishes such as tilapia.

"This problem is now being addressed…by using a collapsible shade for the ponds," the researchers said, adding that this system effectively regulates water temperature, which is conducive for the continuous spawn production of tilapia throughout the year.

To test the effectiveness of their simple research, the researchers applied it to a 20 x 23 meter pond owned by a tilapia raiser at the Provincial Satellite Fish Farm in Barangay Saludarez,

Higher spawn production was observed in April in shaded ponds.

MMSU researchers check the fingerlings of tilapia raised in a shaded pond.

Dingras, Ilocos Norte for a period of seven months, from March to September. The farm is one of the sources of quality tilapia fingerlings in the province with an annual fingerling production of about 450,000.

The researchers used two ponds to test the technology: one was shaded, while the other was not. The pond that was subjected to shading was provided with two units of silver straw net with 40 percent shading capacity as cover. To build the shade, they used bamboo poles that served as braces, and ropes to tie the net.

After installing the shade, they released two strained types of tilapia into the two ponds: the genetically enhanced tilapia excellent, otherwise known as GET EXCEL, and the FAC-selected tilapia known as FaST.

The GET EXCEL strain was developed by the Bureau of Fisheries and Aquatic Resources (BFAR), which was tested to be 38 percent better in terms of growth and yield than the traditional and unimproved tilapia stocks. This strain is being used by BFAR as brood stock to produce quality fingerlings.

On the other hand, the FaST strain is a combination of four local strains of tilapia which was produced by MMSU-CASAT and is now being used by the college to cater to the fingerling requirements of tilapia raisers in Ilocos Norte.

In their experiment, the researchers carefully sorted the brood stocks in conditioning cages installed in ponds for 5 to 7 days before releasing them into the breeding ponds. During this period, male and female breeders were kept in separate cages and the brood stocks were fed with 32 percent crude protein. The researchers maintained the stocking rate of fingerlings at 700 to 800 grams with a sex ratio of three females for one male per square meter.

The shading technology is very effective during the summer.

The fish were given 2 percent feeds in 21 days. This period comprised one production cycle. Results showed that in April, June, and July when the water temperature is high, spawn produced by tilapia in the shaded pond was 77.3 percent more than those raised in a non-shaded pond. For example, the GET EXCEL tilapia in the shaded pond produced 7,060 fry in August, when the temperature of the pond reached 30.39^{o}C, while those in the non-shaded pond produced only 4,827 fry.

A higher number of spawns produced was also observed in April in shaded ponds, with 2,505 fry, and in June with 2,551 fry, when the temperature was maintained at 31^{o}C.

For the FaST strain tilapia in non-shaded pond, they produced only 686 fry in July when the temperature became constant at 33.46 degrees Celsius, while those in the shaded pond with a maintained temperature of 32.05^{o}C produced 1,749 fry.

Fish in the shaded pond also produced more fry in September when the temperature was maintained at 30.89 degrees Celsius (7,131 fry), while those in the non-shaded pond produced only 5,254 fry at a temperature of 31.89 degrees Celsius.

The researchers said that this technology is equally effective with carp, catfish, and giant gourami culture ponds.

CURRENTS

>BY DR. RAFAEL D. GUERRERO III

THE SALINE RED TILAPIA OF PANABO CITY

THE FIRST SALINE red tilapia was developed in the 1970s by Mike Sipes in the United States. He crossbred the mutant male Mozambique tilapia (*Oreochromis mossambicus*), which had a reddish-yellow color, with the dark-colored female of the Wami tilapia (*O. hornorum*) to produce a hybrid that could tolerate salinities (salt concentrations) of 32 parts per thousand (ppt) or more. The hybrid has been referred to as the "Florida Red Tilapia" or "Cherry Snapper."

In Panabo City, Davao del Norte, there is a saline red tilapia known as "Kingfish" which is being cage cultured at the Panabo City Mariculture Park (PCMP) by an innovative fish farmer-entrepreneur. At 74, Pedro Pacatang or "Pete" is considered the pioneer of commercial saline red tilapia production in the country. Pacatang told us that his red tilapia strain is the "Cherry Snapper."

Pacatang has been a Nile tilapia (*O. niloticus*) hatchery operator since 1990, with his six-hectare fish- farm in Carmen, Davao del Norte. He was the Department of Agriculture's Gawad Saka Awardee of Region XI for aquaculture in 2009 for his model tilapia hatchery, which produced all-male (sex-reversed) fingerlings. In 2014, he started producing sex-reversed fingerlings of the Kingfish, which he has successfully acclimated and grown to market sizes in sea cages of the PCMP.

In Pacatang's tilapia hatchery, breeding of the fish and rearing of its young are done in freshwater ponds in hapas (fine-mesh net enclosures). The fertilized eggs in the mouths of female breeders are collected by hand and reared in an indoor facility with artificial incubators. The fry are then stocked in the outdoor hapas for sex-reversal treatment and reared to fingerlings with average weights of 5-20 grams per piece in 1-2 months with commercial feeds and artificial aeration. The

The "Kingfish" in a floating cage of the PCMP.

Acclimation tank for Kingfish fingerlings.

The Pacatang tilapia hatchery in Carmen, Davao del Norte.

hatchery produces 50,000-100,000 fingerlings of Nile and red tilapia in a month.

From the freshwater hatchery, the large red tilapia fingerlings are brought to Panabo City (about 30 minutes away by truck) for acclimation to seawater in tanks built of marine plywood in a building near the PCMP. The fish is acclimated from 0 ppt salinity to 35 ppt at the rate of 5 ppt per day for at least seven days. In the process, pumped sea water is mixed with freshwater for the desired salinity level in the aerated tanks to allow the fish to gradually adapt to the marine environment.

The acclimated fingerlings are stocked at 10,000 per cage in 10 x 10 x 4 meter floating cages made of bamboo frames with floating plastic drums and polyethylene net enclosures, and cultured for four months with feeding of commercial pellets. The fish is harvested with market-sizes of 250-300 grams apiece and a survival rate of 70-80%. Ex-farm prices for live Kingfish are ₱150-₱200 per kilo.

Pete Pacatang

According to Pacatang, the demand for the saline red tilapia of Panabo City is only limited to the live fish market catering to seafood restaurants, unlike with the dark-colored tilapia, which is better accepted by consumers in fresh fish markets. He is now developing a dark-colored saline tilapia hybrid.

BY PAUL M. ICAMINA

LOW HARVESTS MEAN LESS INCOME FOR CORDILLERA POTATO FARMERS

LA TRINIDAD, BENGUET – The demand is high for potato.

Low production and supply, however, beset the country's multimillion-peso potato industry. That means less income for upland farmers in the Cordilleras. The semi-temperate region harvests most of the potato crop in the country, accounting for 99,981 metric tons (MT) in 2016. The tubers come mostly from Benguet (88,771 MT), with 88.8 percent of the total potato production in the region, followed by Mountain Province (11,090 MT), accounting for 11.1 percent.

In 2007, the Philippines produced some 110,752 MT of potatoes, mostly in the Cordillera Autonomous Region (85 percent), Davao (8.3 percent), and Northern Mindanao (5.7 percent). Increasing demand for potato—for example, for French fries and for feed—led to the importation of about 46,887 MT or a third of total demand; that was worth US$ 26.3 million, mostly sourced from Canada, the United States, Australia, and China.

Along with the huge potentials for the high-value crop, potato farming is currently faced with several problems, said Teresita D. Masangcay, a senior research specialist at the Benguet State University (BSU) and the Northern Philippines Root Crops

PCAARRD scientists and partners conduct Science and Technology-based Farm (STBF) technology for potato farmers in Atok, Benguet, 7,000 feet above sea level, on potato. In photo, a participant uses a wooden stick to expose potatoes to the surface.

Tip cuttings being rooted.

Potato mother plants.

Grace Backian posing with a community pot of potato cuttings being rooted in the greenhouse.

Research and Training Center. Production problems are beset by insufficient seed supply and, when available, poor seed quality. Bacterial wilt and cyst nematode infestation also contribute to low production, she said.

Masangcay recommended the use of non-conventional planting materials such as the pea-sized tuber and stem cuttings as well as the use of the local potato variety called Igorota during the Technology Forum on Potato at the Farms and Industry Encounters through the Science and Technology Agenda (FIESTA) of the Highland Agriculture, Aquatic and Resources Research and Development Consortium (HAARRDEC) in Benguet. FIESTA was co-hosted by the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) of the Department of Science and Technology (DOST), to showcase research and development from production to processing to technology transfer. The PCAARRD and its partners—in this case, BSU and HAARRDEC—gathered scientists, farmers, and small entrepreneurs to showcase technologies, innovations, products, and services; assist in the transfer of new technologies for better farming; and connect scientists and farmers.

Igorota is the variety developed in the highlands which is recommended for better production and income for Cordillera farmers, Masangcay said. “It also addresses the issue of low seed quality because it is high yielding and moderately resistant to late blight and leaf miner.”

Although there are no available varieties resistant to these diseases, proper management can be used to limit the damage such as the use of clean planting materials, removal of infected plants, crop rotation and improved farm practices, she added. One such practice is the use of Trichoderma, which is a beneficial microorganism and an effective natural control agent in managing potato diseases.

The Igorota along with the Bengueta varieties were recently introduced by the Department of Agriculture’s Bureau of Agricultural Research and the Northern Philippines Root Crops Research and Training Center, initially to farmers in the Mountain Province. Some 30,000 stem cuttings of the high-yielding potato varieties are expected to double or even triple the yield compared to those produced with the use of traditional planting materials and varieties.

The Igorota and Bengueta varieties are considered the best by Cordillera farmers because these are well adapted to local conditions, high yielding, resistant to late blight, and have favorable culinary qualities.

Farmers in Atok, Madaymen, Buguias, and Mankayan in Benguet and in Bauko and Besao towns in Mountain Province have been trained in the planting and management of the new varieties approved by the National Seed Industry Council.

BY MYRRH CAITHLIN L. GUTIERREZ

ALABAT ISLAND: FIRST MAKAPUNO ISLAND IN THE PHILIPPINES

A LOT CAN BE DONE when people work hand-in-hand.

Different government agencies converged and collaborated to establish the first Makapuno Island in the Philippines. Last February, the Makapuno Island project was launched in Alabat Island, Quezon. "This project is not just a government project, but a project of the people," says Alexander Madrigal, regional director of the Department of Science and Technology (DOST-CALABARZON).

Since 2009, DOST-CALABARZON and the Southern Tagalog Consortium for Industry and Energy Research and Development (STCIERD) have been collaborating for the revitalization of the makapuno industry in CALABARZON. After numerous planning sessions and workshops, the idea of a "Makapuno Island" was formed. Through the efforts of the DOST-CALABARZON, Philippine Coconut Authority (PCA IV-A), Department of Agriculture (DA-IV-A), the Southern Luzon State University (SLSU), and the local government units (LGUs) of Alabat, Perez, and Quezon with support from the Department of Trade and Industry (DTI-IV-A), Department of Labor and Employment (DOLE IV-A), National Irrigation Association (NIA IV-A), Office of the Provincial Agriculturist-Quezon, and the Office of Congresswoman Angelina Tan, the Makapuno Island project was kickstarted. The launching ceremony was attended by the Philippine Chamber of Commerce (PCC) - Toronto, and the trade mission delegates from Canada who assessed the investment opportunities in Alabat Island.

The Makapuno Island Project aims to establish a Makapuno Island in Alabat Island, Quezon by initially putting up a 110-hectare makapuno plantation that would address poverty on the island by giving farmers an additional income source, while significantly contributing to the island's economy. The different government agencies will cooperate to support the island with Embryo Cultured Makapuno (ECM) seedlings and processing technologies.

Also included in their plans is working on the island's branding; it will be known not only as a main source of makapuno but also of coco sugar. To optimize the resources of the island, they are also looking into integrated farming.

The project yielded positive support from its partner agencies. The efforts of the government agencies and the potential of Alabat Island were seen by the Trade Mission delegates.

Assistant Secretary Maria Roseni M. Alvero, Senior Trade Commissioner and Phil. Consulate General of DTI-Foreign Trade Service Corps (DTI-FTSC), of Toronto, Canada, presented her intentions of making Makapuno Island a model investment project in which overseas Filipinos could invest in Filipino businesses. Her proposed project, entitled "Transforming Overseas Filipinos (OFs) [into] Overseas Filipino Investors (OFIs): The Philippine Makapuno Industry and Agribusiness Investment Promotion Program in Alabat Island, Quezon" aims to launch a well-coordinated, harmonized, and sufficiently funded export and investment campaign targeting the Filipinos living abroad. By August 2018, the project will be launched in Toronto, Canada.

Vermelyn O. Evangelista, technical supervisor of PCRDF, assured beneficiaries that the PCRDF will continuously extend their research and development of ECM. She also discussed the processing technologies that the islanders can later use for their makapuno products. Meanwhile, Erlene Manojar, regional manager of PCA IV-A, declared PCA's support by assuring the beneficiaries that "from

(From left) Mayor Ma. Caridad Clacio, RD Dr. Alexander Madrigal, Mayor Fernando Mesa, RD Engr. Arnel De Mesa, and Mayor Pepito Reyes signing the Memorandum of Agreement.

production, processing, up to marketing, PCA will provide the help Alabat Island will be needing."

Mayor Fernando L. Mesa of the Municipality of Alabat thanked all the agencies that made Makapuno Island possible. He assured everyone that they will work hand-in-hand with the various concerned agencies towards the progress of the Island.

The program concluded with a MOA signing of the partner government agencies, a commitment board signing of the "Adopt-a-Makapuno Tree" project, and declarations of support from the different participating agencies. A ceremonial planting of Makapuno seedlings was held at Brgy. Villa Jesus Weste. Rolando Mesa and Rene Mesa, coconut farmers, gave their testimonies regarding makapuno farming and how ECM can be of great help to the island's economy.

Also present at the event were Dir. Marilou Toledo, regional director of the Department of Trade and Industry IV-A (DTI-IV-A); engineer Arnel De Mesa, regional executive director of the Department of Agriculture-CALABARZON (DA-CALABARZON); Milo Placino, president of Southern Luzon State University (SLSU); Kim Darren Pabilonia, representative of the regional director of Department of Labor and Employment IV-A (DOLE IV-A); Mayor Ma. Carida Clacio and Mayor Pepito Reyes of Perez and Quezon, respectively; and over 100 farmer beneficiaries from Alabat Island. **(DOST- Region 4A, S&T Media Service)**

PCC-Toronto and Trade Mission delegates from Canada with their Pledge of Support Board for the Adopt-A-Makapuno-Tree Project.

BY JULIO P. YAP, JR.

ADAPTABILITY OF ANNUALS TO THE PHILIPPINE CLIMATE

THE COMMON BELIEF that colorful flowers can only thrive in cooler highland areas has been shown to be untrue following the development and introduction of heat-tolerant, widely adaptable, and easy-to-grow varieties for the Philippines.

This became possible after Allied Botanical Corporation (ABC) selected and identified a wide range of annual flowers adaptable for both highland farms and the hot lowland farm areas in the country, through its lowland research and development (R&D) facility in Tayug, Pangasinan, and its highland satellite trial station in La Trinidad, Benguet.

According to ABC president Michael Caballes, the interest in annual flowers for small space gardening in the city, property development, national parks, and agri-tourism has grown significantly because nowadays, property buyers are not only looking into the price of the property but also at the aesthetic quality of such projects.

Over the past two years, there has been an increasing interest in using colorful annual flowering plants for property development.

Caballes says that one particular aspect of property development which is often overlooked is landscape development, specifically for 'softscaping' (the horticultural elements of a landscape, according to Wikipedia). Often, developers use cheap, low maintenance green perennials for their landscape projects. "Hence, the need to develop and introduce an assortment of climate-ready annual flowers for the Philippines has already been undertaken by Allied Botanical Corporation several years ago to meet the demand," Caballes says.

Each year, the research and product development team of ABC grows and selects no less than 50 varieties of annual flowers for the different markets in the Philippines. The process of selection is a necessary step to ensure that growers, agripreneurs, and real estate developers will be able to successfully grow these crops.

The interest in annual flowers for small space gardening in the city, property development, national parks, and agri-tourism has grown significantly. In photo is the Flower Showcase exhibit of ABC at the Quezon Avenue Promenade of the Quezon Memorial Circle in Quezon City during the recent Hortikultura Filipina 2018.

The “ribbon untying” ceremony for the recent opening of Hortikultura Filipina 2018 held at the Flower Showcase exhibit of ABC led by PHS officers and dignitaries.

Rowena Bienes of ABC (right) joins Sally Leuenberger (the Orchid Queen of Davao City) during the opening of Hortikultura Filipina 2018.

Enthusiasts and growers who are looking for easy crops to cultivate can go for the Marigold, Vinca, Zinnia, Cosmos, Pelargonium, or Torenia varieties.

Along with the selection process, Caballes says that ABC also develops production techniques which are later shared with potential growers to ensure the success of their flower production. The extensive R&D efforts undertaken by ABC led to the introduction of a wide assortment of annual flowering varieties, like those exhibited during the recent Hortikultura Filipina 2018 at the Quezon Memorial Circle in Quezon City.

During the event, ABC showcased its “Flower Fiesta,” a display in which a collection of heat tolerant annual flowering plants for the Philippines transformed the main Quezon Avenue walkway into a huge and attractive floral garden, greeting visitors coming from the different areas of the venue.

Aside from the attractive colors, forms, and textures of these annuals, ABC has confidently recommended specific varieties for cultivation during the different growing seasons and in various elevations in the country. Whether it is container gardening, annuals for real estate project launching, seasonal themed landscape designs, cut flower and pot plot production, Caballes says that ABC has the right variety, adding that annual flowers not only bring color to a landscape but also encourage life and a whole new ecosystem to thrive. After all, bees and butterflies are particularly attracted to sunflower, cosmos, calendula, salvia, antirrhinum, dianthus, and zinnia.

Bee foraging is becoming a necessity for honeybee farms in the country. Growing these annuals at bee farms ensure enough food sources for the bee population.

Among the major uses of annuals are for bedding and ground cover. When planted in mass populations, they add vibrant color to the landscape. Flower varieties like the Zinnia Double profusion mixed can make for excellent ground cover because the variety comes in vivid colors like red, fire, cherry, yellow, deep salmon, white, and golden. On the other hand, the Torennia Little mixed can be useful as an edging plant, while the Marigold Marvelous flame, orange, and yellow can create warm colors as bedding plants.

Among the more important plants for a landscape are filler plants and plants that are used for the background. For example, different sunflower varieties, like Vincent’s Choice, Fresh, and Pomelo from Sakata would make an attractive backdrop for a park bench or help hide unwanted structures or unattractive hardscapes. Caballes says that these sunflower varieties can grow up to

ABC landscape architect Toni Rivera (left) poses with ABC-NCR regional sales manager Dorry Fadriquela at the ABC flower showcase.

5 to 6 feet tall, making them ideal as background plants.

The Canna Tropical series from Takii, on the other hand, can be an excellent filler or as a hedge plant. They can grow to about 4 to 5 feet tall. The Canna Tropical series comes in yellow, red, rose, scarlet, salmon, and white. The Gomphrena Ping Pong series can become attractive medium-height fillers which produce nice round white, lavender, and neon rose blooms. Some of these annuals, like the Sunflower, Celosia, Marigold, Statice, and Gomphrena, are also used for cut-flowers or dried flowers.

Enthusiasts and growers who are looking for easy crops to cultivate can go for the Marigold, Vinca, Zinnia, Cosmos, Pelargonium, or Torenia.

Caballes assures that ABC will continue to provide flowering plants and technical expertise so that growers and enthusiasts will be able to realize that there are so many flowering plants can also be grown in urban areas and in other places of the country.

Two women take time out to relax and enjoy the soothing effect of having a well landscaped area in the metropolis while visiting the recent Hortikultura Filipina 2018 at the Quezon Memorial Circle.

Agriculture MONTHLY MAGAZINE

An Invitation To Contributors

We are inviting contributors to write articles for Agriculture Magazine. We want stories about people in farming who have practical and do-able ideas. They could be in the production of crops, livestock and poultry, fisheries, ornamental horticulture and others.

Feature stories should be accompanied with appropriate color photos for more impact. We also encourage experts to write how-to articles on various agri-topics. We are also looking for research results that could be helpful to those engaged in any form of farming, small-scale or otherwise.

To those who wish their manuscripts to be returned, if not accepted, please enclose a self-addressed envelope with sufficient stamp. Manuscripts not accepted for publication without return postage will be disposed after one month. All original contributions exclusive to Agriculture Magazine will be paid for at competitive rates.

Send your contributions to:

The Editor
Agriculture Magazine
Manila Bulletin Publishing Corp.
Muralla corner Recoletos St.
Intramuros, Manila
or at agriculture@mb.com.ph

PRODUCERS PUT THEIR BEST FOOD FORWARD AT EXPO

WITH THE GLOBALIZATION of the food trade, the challenge of keeping up with the changes in consumption and demand due to economic growth rises apace.

World-class Philippine food brands at Philfoodex.

The 14th Philippine Food Expo, the country's "Only All-Filipino Food Show," which has been set for April 20-22 at the SMX Convention Center in Pasay City, tackles this with the theme "Emerging Trends in Food Trade." It will gather some 300 leading firms involved in food manufacture, growing, export, equipment, packaging, ingredients, and additives.

According to Philfoodex president Roberto Amores, the rise in spending power in countries in the Asean region results in a greater demand for a variety of new diets which are nutritious and affordable. He added that the Philippine Food Expo will help its members become more competitive in facing the challenges that the Asean Economic Community might present.

Just like in previous editions, the event will be an excellent venue for business matching between and among suppliers and food processors across the country. Seminars to be given during the event include ASPIRE for Agripreneurs: agribusiness support for investments promotion in regional expositions, franchising opportunities, application of the TRAIN Law to the food industry, and the impact of DOST Set Up Programs on SME adaptors

Other topics include trends and business opportunities in the Asean food and beverage industry, threats to food business, financial assistance for SMEs, productivity and innovation, adapting GS1 barcodes, renewable energy, and packaging and logistics services.

Co-organized by the Philippine Exporters Federation (Philexport), the Deparment of Agriculture, the Department of Trade and Industry and the Export Marketing Bureau, the expo will also include the Choco, Coffee and Tea Festival. This side event is a display of concoctions of a variety of brews and blends, and will feature a culinary showdown for college students and faculty, and a barista challenge.

The Philippine Food Expo is a must-visit event for everyone, from the everyday Filipino consumer to international traders and importers of food products. The three-day event Expo is organized by the Philippine Food Processors and Exporters Organization (Philfoodex) Inc.

For details, visit www.phillippinefoodexpo.com, or contact Cut Unlimited at (02) 372-7023 to 25 and info@eventsbycut.com.

NEW PRODUCT MAKES FRUITS SWEETER WITH BETTER COLOR AND LONGER SHELF LIFE

A NEW PRODUCT that, it is claimed, can help make fruits sweeter, improve their color, and promote a longer shelf life is now in the Philippines. This is called "Sweet Biostimulant," a product that consists of plant extracts manufactured by Valagro, a top biostimulant manufacturer in Italy.

Sweet Bio, for short, is a liquid that is mixed with water and then sprayed on the leaves and fruits. In papaya, for instance, 50 to 100 ml (2 to 4 caps of the container) is mixed with water in a 16-liter knapsack sprayer. It is first sprayed on the fruits and leaves about 13 days from harvest. This is followed by another spraying 7 days from harvest. To treat the succeeding fruits on the tree, spraying is done every 15 days.

Aside from papaya, Sweet Bio can be sprayed on mango, lanzones, Abiu, dragon fruit, watermelon, honeydew melon, and other fruits with thin rinds.

Papaya treated with Sweet Bio becomes sweeter with improved rind color and longer storage life.

Harold Hazel A. Larete of Zetryl holding a liter of Sweet Bio.

Sweet Bio can also improve the quality of flowers. When sprayed on flowering plants, the flowers become more intense in color, with longer keeping quality.

Sweet Bio is distributed by Zetryl Chem Philippines. For more information, call Harold Hazel Larete, assistant general manager, at 0917.816.1909 or Bien Magcalas, senior marketing executive, at 0917.509.0695. It is available in one-liter packs.

THE POOR FARMER WHO BECAME RICH

(Memoirs of an Agri Journalist)

IN MAY 1992, the late Abraham Tadeja, who produced organic fertilizer, brought me to Cabanatuan so I could interview his customer who started very poor but had become rich, a millionaire in his own right after 22 years of farming with a business sense.

The fellow was Anastacio "Amang" Lopez of Brgy. Baquero, Cabanatuan City who only finished elementary schooling. When he got married at 20, in 1970, all he had was 8,500 square meters of rice land given to him by his father. At that time, he did not even have money to cultivate the farm. He had to borrow from a local rice miller so he could buy some seeds, fertilizer, and other inputs, and then paid his debt with his palay harvest.

In the "hampas" method of threshing, the palay is threshed against a frame of wooden slats to separate the grains; afterwards, a blower is needed to clean the grains. That is where Amang Lopez made money with his blower.

When I interviewed him 22 years after he got married, he already owned 14 hectares of irrigated rice land and also tilled another 10 hectares mortgaged to him by other landowners. His small bamboo and wooden house, which was blown down by Typhoon Saling some years back, had been replaced with a spacious concrete house complete with the amenities of modern living like a refrigerator, fine furniture, stereo, color TV, and even an encyclopedia set.

He also owned three power tillers, a rice mill he bought for ₱300,000, and a truck worth ₱450,000 for transporting his produce. The cash-strapped farmers also depended on him for loans. He had become a financier whose borrowers paid in the form of palay.

How did Amang become so rich? The answer is hard work and common business sense. He could easily spot a moneymaking opportunity, like in those early years when threshing machines were still unknown and threshing was done by the "hampas" method that required blowers to winnow the threshed palay.

Amang readily saw an opportunity to make money. He sold a couple of his pigs so he could buy a blower which he rented out to farmers. The farmers who rented his blower paid him two kilos of palay for every sack winnowed. Since one blower can winnow 200 cavans daily, that meant 400 kilos of palay rental every day, equivalent to 8 cavans.

Later, when the mechanical thresher arrived on the farming scene, Amang saw another moneymaking opportunity. He sold some more of his pigs so he could buy his own thresher. This was even a bigger earner for Amang. In one harvest season, his thresher could earn for him 500 cavans of palay.

With the palay that borrowers paid him, he and his wife had to put up a small store in Cabanatuan where they could sell the rice from their own harvest and from the payments-in-kind by farmer-borrowers.

The story of Amang could inspire other small farmers to have more business sense and be more enterprising.—**ZAC B. SARIAN**

U.S. GOVERNMENT ANNOUNCES FOOD AID FOR FAMILIES AFFECTED BY MARAWI CONFLICT

THE U.S. GOVERNMENT, through the United States Agency for International Development (USAID), announced new assistance of ₱100 million (US$ 2 million) to boost food security in Marawi and surrounding areas.

USAID is partnering with the World Food Programme to provide 1.8 million kilograms of rice—enough to feed 45,000 people for four months—to families displaced by the conflict.

At the recent ceremonial handover of rice to Philippine government officials, U.S. Ambassador Sung Kim said, "The U.S. government continues to stand by the Filipino people as a friend, partner, and ally to support those affected by the Marawi conflict as they rebuild their lives."

The assistance, which will help ensure an adequate food supply for families affected by the Marawi conflict, brings the total U.S. government contribution to the Marawi humanitarian response to nearly ₱1.2 billion (US$ 22.9 million).

Ambassador Kim was joined by Undersecretary Emmanuel Leyco, Officer-in-Charge of the Department of Social Welfare and Development (DSWD); Assistant Secretary Kristoffer James Purisima, Spokesperson of Task Force Bangon Marawi; and Stephen Gluning, Country Director of the World Food Programme.

The U.S. government, through USAID, has been a key partner of the Philippine government in the recovery, stabilization, and rehabilitation of Marawi City and surrounding areas. USAID continues to work closely with the Philippine government and development partners to deliver life-saving humanitarian assistance and promote long-term stability in Marawi.

About USAID: *USAID is the lead U.S. government agency for international development and disaster assistance. In the Philippines, USAID partners with the national government to build a more stable, prosperous, and well-governed nation. For more information, visit http://www.usaid.gov/philippines or email infoph@usaid.gov.*

Ambassador Sung Kim (center) leads the ceremonial handover of rice to Undersecretary Emmanuel Leyco, Officer-in-Charge of the Department of Social Welfare and Development (second from left) and Assistant Secretary Kristoffer James Purisima, Spokesperson of Task Force BangonMarawi (leftmost) during the ceremonial handover held in Taguig City. Also present are Stephen Gluning, Country Director of the World Food Programme (second from right) and Clay Epperson, Deputy Mission Director of USAID/Philippines.

Ambassador Kim and (L-R) Assistant Secretary Purisima, Undersecretary Leyco, World Food Programme Country Director Gluning, and Deputy Mission Director Epperson of USAID Philippines holding the rice.


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SEARCA BATS FOR INCLUSIVE AND SUSTAINABLE VALUE CHAINS

REMAINING UPBEAT in steering an inclusive and sustainable agricultural and rural economy, the Philippine government-hosted Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) brings to the fore the significance of value chain development towards improving market system productivity while highly regarding marginalized farmers' inclusivity.

This is the core of the Value Chain Development Course conducted by SEARCA last March 2018. The academe, national government agencies, local government units, and non-governmental organizations were represented by participants from the Philippines as well as Cambodia, Lao PDR, Timor-Leste, and Vietnam.

SEARCA pioneers the value chain development course in keeping with its focus on inclusive and sustainable agricultural and rural development (ISARD), which is aligned with the United Nations' Sustainable Development Goal (SDG) to promote inclusive and sustainable economic growth, employment, and decent work for all.

With social inclusion as one of ISARD's defining elements, the course presents how marginalized actors can be given economical precedence and be socially included or upgraded in the agricultural value chain.

SEARCA Director Gil C. Saguiguit Jr. stressed the importance of value chain development in driving agricultural and rural development in Southeast Asia. He counts training courses among SEARCA's efforts to strengthen social inclusion to promote greater participation and productivity of farmers and rural producers.

He noted that the training is a vital step in developing a value chain framework that will facilitate the equitable integration of smallholder farmers and rural entrepreneurs in regionally integrated and borderless agribusiness markets. "We believe that efforts to integrate small-scale farmers into commercial food systems is key to national and overall regional development, especially in view of the ASEAN economic integration."

Meanwhile, Prof. Wilfredo Carada of the University of the Philippines Los Baños-College of Public Affairs and Development, who led the team of course resource persons, affirmed that looking through a value chain lens defines inclusive and pro-poor development in its truest sense. He advocated the use of "VCD4ISARD" as a call to action towards developing sound interventions for smallholders, small-scale businesses, landless laborers, and women, who participate in agricultural value chains as producers, traders, processors, laborers, and retailers.

Participants from the Philippines discuss how to approach the value chain for cacao.

Prof. Carada noted that VCD4ISARD can be a tool to give these marginalized actors a fair share in the value chain process. "What we need to embrace is the inclusive definition of the value chain. This means we need to make the poor participate directly in economic activities, and make their participation translate into increased income and improved well-being. We must not merely rely on the 'trickle down' process in aiming for sustainable development."

The five-day course is composed of three interactive workshops and nine lecture-discussion sessions. It combines the fundamental frameworks, principles, components, and processes of the value chain system and their practical skills and application. Workshop participants were tasked to work in six groups that developed a value chain development plan for cocoa, rice, abaca, sugar, coconut, and swine—commodities identified as having great potential and relevance to ISARD. Each plan includes a sector situationer, value chain analysis and mapping, value chain development strategy, institutional arrangements, and monitoring and evaluation design.

MORE FARMERS ARE FINALLY SOLD ON HYBRID VEGGIE SEEDS

DURING A PROGRAM at the Hortanova Farm in Lipa City last January, Simon N. Groot, the founder of East-West Seed, revealed that it was not easy to sell farmers on the idea of planting hybrid seeds. It took the company about ten years before 20 percent of local farmers finally appreciated the advantages of planting hybrid vegetable seeds. After that, it was fairly easier to convince more farmers to grow hybrids.

Renato C. Rabanera in his watermelon plantation.

He grows his watermelon seedlings in plastic trays.

Well, if only as a consolation, he said, it took 18 years for 100 percent of corn farmers in Iowa in the United States to embrace hybrid corn seeds. It is, of course, understandable in the Philippines where the small farmers are usually short of cash so that they hesitate to purchase the more expensive seeds. But now so many of them are convinced that growing hybrids is the way to go.

HYBRID SEEDS BENEFICIARY - One of the beneficiaries of hybrid crops is Renato C. Rabanera of Alaminos City, who is now considered the "Watermelon King" of Pangasinan. He was once a small-scale planter of rice and watermelon. But with the good results he got from watermelon, he was able to increase his production and, of course, his income. Last cropping season, he was able to harvest 120 tons of Sugar Ball watermelon that earned him ₱1.8 million.

As a result of his good income, he has adopted improved techniques of crop production. He has bought a tractor not only for preparing the land for planting but also for hauling his harvest; a truck to deliver his watermelons to the market; additional hectares for a bigger operations; techniques like the adoption of drip irrigation, germinating seedlings in seedling trays; the use of plastic mulch; and others. Above all, he was able to send his four children to school.

According to Mario M. Bibat of East-West, Rabanera loves planting the Sugar Ball hybrid because it is a vigorous variety that produces big fruits and is resistant to diseases.—**MARIO M. BIBAT**

Rabanera has bought a tractor not only for cultivation of his fields but also for hauling his harvest.

BY JULIO P. YAP, JR.

"PANAAD" SHOWCASES ORGANIC PRODUCTS OF NEGROS

Negros Occidental Governor Alfredo G. Marañon Jr. is inviting agriculture enthusiasts and agripreneurs to join the silver anniversary of the "festival of all festivals" during the holding of the 25th Panaad sa Negros Festival.

THE PROVINCE OF NEGROS OCCIDENTAL invites everyone, particularly agriculture enthusiasts and agripreneurs, to the Silver Anniversary of the "festival of all festivals" during the 25th Panaad sa Negros Festival from April 14 to 22, 2018, which will be held at the vast Panaad Park in Mansilingan, Bacolod City.

"Come and experience the best…Negros Occidental's 13 cities and 19 municipalities [have to offer] as they showcase their products, arts and culture, tourism destinations, trade and investments, livelihood skills, and even sports, [during the week-long] festivities," Negros Occidental Governor Alfredo G. Marañon Jr. says.

According to Marañon, Panaad has been adjudged by the Department of Tourism (DOT) and the Association of Tourism Officers of the Philippines (ATOP) as the "Best Tourism Event-Provincial Category" in the Philippines.

Different exciting activities have been lined up for this year's edition of Panaad, including an organic agriculture fair, livestock and dairy fair, trade fair and exhibit, eco-garden show, and the unique bamboo village where various products made out of bamboo will be showcased. Visitors can also attend lectures such as "Livelihood Opportunities through Mushroom Production," "Swine Diseases Seminar," "Goat Products and By-Products Utilization," "Fish Value Adding (Bangus Deboning, Dilis Cooking, Fish Polvoron)," "Market Opportunities for Special Rice," "Peking Duck Meat Processing," and the "Farmers and Fisherfolk Congress." These activities will be handled by the Provincial Veterinary Office (PVO) under Dr. Renante J. Decena.

Aside from the annual holding of the Panaad Festival, Marañon is pushing for the full mechanization of rice production in the province. He stressed that farm mechanization would require minimum human intervention and make rice production in the province faster and more efficient.

Marañon says he is also planning to mechanize rice production in other towns and cities in the province as part of fulfilling his promise to make Negros Occidental rice-sufficient. He said earlier that rice production in Negros Occidental is on the rise. Because of this development, Marañon is encouraging farmers to engage in organic rice farming because there is a huge demand for its yield and is more profitable.

For her part, Negros Occidental Tourism Department head Christine Masinares says that the province has a wide array of beautiful scenic spots, parks, exotic resorts, mountains, caves, and other natural wonders with great potential for private investment

Among the many products of the Negrenses are the native bananas which are tastier and healthier to eat.

Batuan is among the favorites of the locals for cooking sinigang-like dishes.

Hygienically-sealed products like organic red and black rice, organic coffee, and naturally-produced muscovado sugar will be showcased during the event.

The ever-famous piaya will always be available during the event.

Organic products in a local market in Negros Occidental.

Among the highlights of the Panaad Festival is a street dancing competition in which groups from different cities and towns will participate.

in tourism projects and related support services.

She says that Negros Occidental is a showcase of sound environment management practices, with two protected forest areas (Mount Kanlaon and Northern Negros Natural Parks), and two marine reservations (Sagay Marine Reserve and Danjugan Island Marine Sanctuary) that are home to various species of flora, fauna, and marine life.

"We will sustain existing programs, both of government and private sector partners, for conservation, rehabilitation and protection of the environment, especially our coastal areas, forest reserves, and major rivers and water bodies," she said.

BY PABLITO P. PAMPLONA, PH.D.

COCO SUGAR HUB IN NORTH COTABATO HAS POTENTIAL TO ALLEVIATE POVERTY

THE SWEET HARVEST Coconut Multiple Cooperative's (SHCMC) ₱25 million project, "Kaanib Enterprises Development Project" (KEDP), was recently launched.

BENEFIT TO SMALL FARMERS

The operation of the hub shall provide benefits to hundreds of small coconut farmers in the municipalities adjacent to Carmen, Cotabato like Aleosan, Magpet, Alamada, Arakan, Kabacan, and Pikit, particularly in providing employment to coco sap tappers and women processors. According to Jerry John Taray, chairperson of the SHCMC co-op, the hub will encourage and capacitate small farmers to produce partially processed coco sugar or syrup. In turn, the hub will buy the syrup from the farmers at good prices.

Syrup is made by boiling freshly harvested sap immediately after each harvest for a few minutes. The purpose is to arrest the conversion of the sap into wine or vinegar. The final stages of processing, packaging, and storage for export is carried out in the hub. Participating farmers and coconut sap harvesters will be provided with extensive training on organic coconut farming, scientific sap gathering, and partial processing.

The SHCMC will help facilitate the certification of the farmer-participants' farms as organic farms. Each farmer-cooperator will be provided with a standard stove of two to four vat capacities or "cawa" to partially cook freshly harvested sap into syrup (Fig. 2). Farmers who regularly deliver syrup from their organically grown coconut trees in good quantities will be invited to become members of the coop with a share of its income through dividends. Consequently, they become entrepreneurs who will be trained to produce other high value coco products.

HOW INCOME IS GENERATED

The production of coco sugar provides high incomes for both farm owners and sap gatherers. This writer's research shows that a healthy, organically grown coconut tree produces an average sap yield of 2.0 liters (L)/tree per day. The yield can be more during the months of high rainfall and when high yielding varieties or hybrids are used. The hub will buy the sap at ₱8/L, of which ₱4.50 goes to the tapper while ₱3.50 will go to the landowner. A hectare of coconut of 100 to 120 trees below 25 feet tall requires two full-time sap gatherers tapping 40 to 70 coconut trees. Depending on the skills and speed of the tappers, the height of the tree, and the terrain of the land, a hectare (ha) of coconut farm with two coco sap gatherers is expected to generate a combined income of ₱576,000 (Table 1). The amount of ₱324,000 goes to the two sap gatherers and ₱252,000 goes to the farm owner. This means that each sap gatherer generates an income of ₱162,000/year or ₱13,500/month.

As shown in Table 1, the higher income from coco sugar production can be further increased by planting high yielding hybrids and varieties at higher densities of 200 plants/ha.

Based on the results of the experiments carried out by this writer, following the technology of high density planting in Thailand and Malaysia, dwarf coconut varieties like the hybrid "Matag" and the superior varieties "Nam Wan" and "Nam Hom" are most productive at a closer population density of 200 trees or at a distance of 7 x 7 meters (m). Matag is planted in Malaysia at 200 plants/ha; Nam Wan and Nam Hom are planted in Thailand at a population density of 270 plants/ha.

At a density of 200 plants/ha, the coconut varieties planted as part of the experiment in Kabacan, Cotabato showed that these hybrid varieties have the same or much higher sap yields over the traditional varieties planted at the low density of 100 trees/ha.

The high sap yield of Matag was confirmed in the experiment carried out by PCA (Philippine Coconut Authority) researchers at the Zamboanga Experimental Center, conducted by Dr. Ramon Rivera and his team. They found that during rainy months, the yield averages 2.9 L/day. This means that coco sap yield can be increased by irrigation. Indeed, in Cotabato, the on-farm survey of this writer showed the sap yield of coconut trees planted adjacent to irrigation canals and rice fields averaged more than 3.0 L/day. At high densities, planting a hectare of coconut for coco sugar production can give an income of over ₱1 million/year (Table 1).

(Fig. 1: Clockwise from upper left) Jerry John Taray welcoming the guests and visitors during the inauguration of the hub. PCA administrator Romulo dela Rosa, Taray, and Loreto Cabaya, representing the governor's office of North Cotabato, unveiling the marker of the coco sugar hub. PCA officials handling the ceremonial check of ₱13.7 M to Taray as PCA's support to the hub.

PROVIDING INCLUSIVE GROWTH

A survey carried out by this writer in the province of Cotabato showed that the yield of coconut trees with heights of 25 feet or less averaged 60 nuts/tree/year or 6,000 nuts/ha/year. He found that typical coconut farmers who process and sell their products in the form of copra earns ₱46,000/ha/year. If the end product is dehusked nuts, the farmer earns higher (₱58,000/ha/year). This means that even with two ha, farm owners remain poor as their incomes from the sale of either copra or dehusked nuts is below the national poverty threshold level of ₱135,000/year. The labor income for copra worth ₱23,000 is higher than the income when the end product is dehusked nuts at ₱11,800.

Table 1. Projected income of farmers and coco sap gatherers in coco sugar production.

PARTICULARS	TOTAL INCOME (₱)	TAPPER'S SHARE	LAND OWNER'S SHARE
A. CURRENT SCENARIO			
1. Income/tree/day	480	270	210
2. Income/tapper per month of 50 trees	24,000	13,500	10,500
3. Income/tapper per year of 50 trees	288,000	162,000	126,000
4. Income/ha per year of coconut of 100 trees – traditional tall varieties	576,000	324,000	252,000
B. FUTURE SCENARIO			
1. Income/ha per year of coconut of 120 trees of high yielding dwarf varieties	692,200	388,800	302,400
2. Income/ha of 200 trees/ha of Matag, Nam Wan and Nam Hom	1,152,000	648,000	500,000

Notes: Tapping of each tree is carried out four times a day at 5 AM, 1 PM, 5 PM and 10 PM.

Fig. 2. Gathering of the coco sap (left) and an on-farm facility (still under construction) meant to provide co-op farmers with a place to cook the sap into syrup.

A coconut farmer with one ha producing and selling coco sap for sugar earns ₱324,000/ha/year. This is above the poverty threshold level. S/he also provides a high income of ₱162,000 to each of the two sap gatherers s/he employs, which is also above the poverty threshold level. This shows inclusive growth among the farm owners and the tappers as their incomes are above the poverty threshold level.

THE BRAINS BEHIND THE HUB

Spouses Jerry John and Jocelyn Taray are the enterprising couple behind the establishment of the cooperative which operates the hub. Years ago, after returning as OFWs, the Tarays were looking for crops to plant for high income. The coconut tree was not among the crops they wanted to plant. It was PCA coconut breeder and Jerry's buddy Gerardo Baylon who convinced the Tarays to plant coconut. Jerry Taray bought coconut seedlings and planted a few hectares to the high yielding varieties Tacunan and Catigan.

As the Tarays attended an international conference on coconut, they met a foreign participant who convinced them to produce organic coco sugar, which he guaranteed to buy at a good price. Jerry Taray took on the challenge by working hard to meet the quality requirements, hiring hired sap gatherers for his fruiting organically grown coconut trees. He sought the help of experts like Tommy Jalos, who was then the PCA regional manager for Region 12.

He also tapped the support of the Department of Agriculture (DA), Department of Trade and Industry (DTI), Department of Science and Technology (DOST), and other agencies for the facilities and technology to produce world-class organic coco sugar. The hard work paid off; the Tarays' production of high quality coco sugar generated interest among many foreign buyers. Jerry Taray traveled abroad extensively and exhibited his product at trade fairs in Australia, Japan, Germany, France, and the USA. He got commitments from prospective buyers who wanted to contract with him to buy coco sugar. These buyers told him that his product was better than those produced by other countries.

Soon, the small family enterprise called "Tree of Life" that Jerry and Joy Taray put up to produce coco sugar could no longer cope with the increasing demand. That was why they organized the SHCMC and sought the help of the PCA in putting up the hub for large-scale production. The strategy is to partner with small landholders with organically grown coconut trees to produce the coco syrup which the hub would buy for final processing.

Aside from the PCA and the other government agencies mentioned earlier, they got commitments of support from Landbank, the province of Cotabato, and others. Jerry Taray plants to expand, with his farmer-partners, the production of other high value coconut products at the Hub for which there is a high demand in the world market.

His mindset towards coconut trees has completely changed. Coconut is no longer a "poor" crop for him; now, through partnerships in the Hub, it can be used to help others. It is his wish that coconut sap tappers make wise use of their new higher incomes in sap production. Many of them mismanage this, and he

Fig. 3. Some of the facilities of the hub include (clockwise, from top left) a vat or "kawa" for cooking sap into sugar; for cooking syrup into sugar; an area for storage of the bulk processed products; and cabinet driers.

would like to help them become highly paid quality employees: trustworthy, disciplined, and industrious. He believes they should be responsible stewards of their incomes and to this end, he plans to tap the assistance of TESDA and community spiritual leaders.

LEARNING FROM A GOOD EXAMPLE

The PCA initiated and financed this hub, only the second of its kind in the country. It is this writer's belief that the PCA should establish many more similar hubs, and not be limited to coco sugar but also aim for the production of other high value coconut products which are in high demand in the world markets.

The hub should be selected wisely so as to provide small coconut farmers with high incomes for inclusive growth in order to help them overcome poverty. Such products include the coco water from mature nuts, minimally processed young nuts with coconut water and soft nuts, coconut milk, virgin coconut oil, desiccated coco flour, and coconut pastries. Many successful coco hubs in India, Thailand, and Sri Lanka can serve as models to follow.

Farmers in countries like Brazil, Mexico, and Thailand, with smaller areas devoted to coconut than in the Philippines, are deriving big incomes from coconut water, which is gradually but steadily reaching the sales levels of orange juice and soft drinks in the world market. Medical findings show that coconut water from young nuts is one of the best drinks for hydrating the human body. It helps free kidneys from urethal stones, clean the digestive tracts, remove toxins from the body, lower blood sugar, and aid in digestion, in addition to having anti-viral, anti-fungal, and anti-microbial properties that help prevent or cure many diseases.

There is also an increasing demand for coco milk in China, as with virgin coconut oil, coconut chips and pastries as healthful snacks, and for more coco products worldwide. Coconut farmers from other countries like India, Thailand, Sri Lanka, and Brazil are partially meeting the increasing demands but still more products are needed to close the gap. Farmers in India with less than one ha earn incomes of over a million pesos by selling coconut high value export products through their hubs.

Here are two recommendations for the PCA.

1. Conduct more research and market promotions: The PCA should intensify its research to generate new and improve existing technologies and innovations in coconut. New coconut products should be made readily accessible to the world market. Research is needed to improve the quality of coco sugar and at lower costs of production for competitive purposes. Information available to the author as of this writing reveals that the Indonesia's farmers are already producing the same quality of coco sugar produced in the Philippines at a much lower cost. Consequently, they are offering their coco sugar in the world market at a reduced price: only 70% of prices set by Filipino coco sugar processors.

A model to follow in research and development in coconut is what the Malaysian Palm Oil Board (MPOB) did with oil palm. After five decades, a lowly crop from Africa became a major source of cheap vegetable oil plus hundreds of other diversified products readily available in the world market. The Philippines imports annually almost US$ one billion worth of palm oil from Malaysia, which provides Filipino homemakers with a vegetable oil which is much cheaper than coconut oil.

Table 2. Comparative annual income of a coconut farm with 100 trees/ha in the province of Cotabato, as affected by the sale of various end products.

END PRODUCT SOLD/ VOLUME/ha (kg/L)	LOCAL BUYING PRICE (₱)	TOTAL FARM INCOME (₱)	INCOME SHARING (₱)	
			FARM OWNER	LABORER*
1. 2,300 kg of copra	30/kg	69,000	46,000	23,000
2. 10,800 kg dehusked nuts	6.5/kg	70,200	58,400	11,800
3. 72,000 L of coco sap	8/liter	576,000	252,000	324,000

* The labor requirement for the production of copra and dehusked nuts is seasonal: every 2 to 3 months. The labor requirement for coco sugar production is daily: two tappers/ha tapping four times a day.

Multidisciplinary and consumer-oriented research at MPOB was responsible for this.

Research is being carried out by over 100 full time researchers—almost all of which have Ph.Ds from the best universities in Europe and USA. According to Oil World (2016), the world trading of vegetable oil is topped by palm oil at 31%, 25% for soybean, 12% for rapeseed, 8% for sunflower, and only 1.0% for coconut oil. The current Philippine export of coconut oil and other related products at US$ 1.7 billion annually can be multiplied several times with effective research, product development and market promotion.

2. Overcome poverty through inclusive growth

The PCA should provide support for programs and strategies like the coco hub, which has the great potential to give its participants higher incomes and create inclusive growth so as to help overcome widespread poverty in coco lands. This end product is important as the traditional sale of copra and dehusked nuts doesn't bring about inclusive growth; only the processors of copra and dehusked nuts become wealthy. The coconut farmers remain poor. Of course the PCA should encourage buyers of dehusked coconuts and copra to bring about inclusive growth in the coconut industry as is done in other countries.

As observed by this writer, dehusked nut buyers in the Philippines and those in other countries process the same export products, like coconut oil, coconut water, desiccated coconut, and coconut milk for the export market. The difference is, processors in the Philippines pay local farmers lower prices compared to the prices paid by processors in other countries like Thailand. For example, in May 2017, the price of dehusked nuts in the Philippines was only ₱8/kg while those in Thailand were ₱14/kg.

This writer asked one of the dehusked nut procurement executives in the Philippines buying one million nuts/day the reason why. He told this writer that he equates the price of dehusked nuts with the level of the price of copra. This writer asked the same question of a dehusked nuts buyer/officer in Thailand, and he was told that their pricing in Thailand is based on the market price of the processed products like coconut water, young nuts, processed milk, etc. According to this Thai nut procurement officer, part of the high income from the processed products is being shared with the farmers as a part of their corporate social responsibility.

There are many ways of overcoming poverty in coco lands and the PCA should adapt as many of these as possible. Other than those discussed above, these techniques include intercropping with high value crops like cacao; integration of livestock like native chicken, goats, and cattle; and massive replanting of hybrids and high yielding varieties to increase farm productivity and income.

A starting point for the PCA to capture all of these technologies is by sponsoring an international forum on ways to overcome poverty in the coconut industry. Experts and successful small coconut landholders from other countries and within the Philippines may be invited to share their strategies and experiences. The inputs from such a forum may be used as a basis for future PCA programs to overcome poverty in coco lands. In doing so, PCA shall accomplish the third mandate of its creation through PD No 232 in June 1973: "…farmers become beneficiaries of the development and growth of the coconut industry."

FINAL NOTES

The Philippine Coconut Authority (PCA) provided ₱13.9 million for the purchase of state-of-the-art equipment for use in the production of world-class quality coco sugar for export by the SHCMC's KEDP. Other costs were funded by a loan from Landbank and by the Tree Life Enterprise (TLE), in Carmen, Cotabato. In addition, TLE donated a plot of prime land at the center of the poblacion of the municipality of Carmen where the hub's buildings are constructed for equity.

TLE, a family enterprise owned by the Tarays, successfully pioneered the production of export quality organic coco sugar in Cotabato. The coco sugar produced by TLE has gained wide market acceptance, thereby creating a huge demands for it which will be met by the SHCMC. TLE will share the technology of the production of world-class coco sugar.

Guests, visitors, and members of the SHCMC were excited and optimistic during its recent inauguration. The hub is expected to bring high incomes to participating coconut farmers, four or more times higher than when a farmer sells copra or dehusked nuts. A farmer who does well in serving the cooperative qualifies a farmer to become a member of the coop as an entrepreneur earning dividends. Many high income jobs in the tapping and processing of coco sap to coco sugar will be created. The project is destined to provide inclusive growth to the coconut industry, thereby helping overcome poverty in coconut lands.

Many national key officials of the PCA came for the inauguration, headed by Administrator Romulo Y. dela Rosa. Representatives of the DTI, Landbank, DOST, and the provincial government office of North Cotabato were also present.

BY KIM KAPLAN

CROPS HOLD ONTO HARMFUL MUTATIONS THAT REDUCE PRODUCTIVITY

ITHACA, NEW YORK—Limits on improving yield and other critical traits in maize likely are due to rare harmful mutations genetically linked to a beneficial gene combination that were selected for during domestication and breeding, according to a study published today in the journal Nature.

These ears of corn demonstrate some of the differences mutations maintained at the Maize Genetics Cooperation Stock Center. *(Photo by Keith Weller)*

These so-called deleterious genetic mutations result from errors in the DNA that occur randomly every generation and accumulate from ancient mutations right up through the breeding of today's best varieties. The same problem is likely to be true not only in maize but in all crops.

"The next generation of enhanced varieties is likely to come by fixing these kinds of rare mutations, which could lead to improved crop yields, more efficient high-performing plants, and being able to grow crops on less acreage," said Karl Kremling, lead author of the paper.

Kremling is a graduate student of geneticist Edward Buckler with the Agricultural Research Service's (ARS) Plant, Soil and Nutrition Research Laboratory in Ithaca, New York. Buckler is the paper's senior author and an adjunct professor of plant breeding and genetics at Cornell University.

To evaluate the impact of deleterious mutations, the researchers created one of the largest public data sets of gene expression in plants. Deleterious mutations can lead to gene expression that is too high or too low, causing subpar performance. In humans, like plants, deleterious mutations, including those that dysregulate expression (suboptimal gene expression), can lead to subpar performance and diseases.

The data set includes nearly 300 lines of maize varieties and nearly 80 million observations of gene expression. With it, breeders will be able to link a phenotype—an observable or physically expressed trait—to differences in gene expression. Even subtle correlations between a phenotype and gene expression can be teased out for many physiological, disease, or nutritional traits with this data base.

In this study, the data set allowed the researchers to link deleterious mutations in maize to certain abnormal phenotypes. They also showed that some of these rare mutations were made more abundant during the process of domestication and adaptation to U.S. environments.

"We were able to show that a substantial portion of the variation in productivity in maize is coming from dysregulation," said Buckler. "The data set is a community resource that will allow maize and other crop researchers to address numerous questions," he added.

The study was funded by the ARS, the National Science Foundation, Cornell University's Plant Breeding and Genetics Section, and the Taiwanese Ministry of Science and Technology. **(ARS News Service)**

AN EXECUTIVE'S QUALITY SALTED EGGS

(Memoirs of an Agri Journalist)

ONE YOUNG EXECUTIVE'S idea of farming as a sideline impressed us when we met him at the Agi-Kapihan in February 1993. He was into producing salted duck eggs and raising hito. His main strategy was to stay small and manageable, but always maintaining the high quality of whatever he produced, first and foremost.

The fellow is Efren Sotto, who was at the time of our interview the communications manager of Pilipinas Shell's Corporate Affairs Department. He finished a Foreign Service course at the University of the Philippines but was very much interested in farming, raising ducks and hito on his farm in Laguna.

Unlike other ambitious raisers, Efren just maintained a flock of ducks numbering 500 which gave him an average of 260 eggs a day. That already gave him a fairly good return because he added substantial value by making salted eggs that commanded a premium price of ₱4 apiece. At that time, that was considered a high price as most other salted egg makers sold theirs at ₱3.20 each.

His salted duck eggs were not colored red but they carried a seal of guarantee. If for one reason or another the buyer thinks the egg s/he bought was below standard, s/he could return the seal and it would be replaced. But Efren hastened to add that did not happen because he really saw to it that the salted eggs' quality was always maintained. The yolk of his salted egg was oily and did not have any undesirable smell. How did he maintain the high quality?

Well, he only salted the eggs that he produced in his farm. That way, he was really sure that the eggs were fresh. Some of the other salted egg makers, he observed, used infertile eggs that were discarded by balut makers after candling. Those were at least 10 days old and they didn't make quality salted eggs. He also saw to it that the clay that he used for aging his salted eggs was not re-used to avoid contamination.

Efren did not have any problem selling his eggs. One Shell gas station on his way to the office got a lot of his salted eggs. Co-employees and those of nearby offices also accounted for much of his daily sales. He only had his driver to help him in the delivery.

HIS HITO PROJECT – As with his duck project, Efren started small but he made sure that his produce sold at a higher price than those of his counterparts in the industry. He raised only 1,000 hito in his pond compared to the tens or hundreds of thousands of the other raisers.

A small hito project, he said, is very manageable. He had studied the market and sold only the size that commanded a higher price of ₱20 per kilo than the next hito producer.

To save on feeds, he took the trouble of going to the Navotas fishport after midnight to buy trash fish for feeding his catfish. Trash fish in Navotas then could be had for just a small fraction of what the ordinary market vendors in other markets would charge.

Sometimes, he would also sell part of the trash fish he bought to other catfish raisers for a small profit. That also further cut the cost of feeding his own fish. **—ZAC B. SARIAN**

HE BOUGHT THE SAME BREED ORDERED BY JAPAN'S EMPEROR

(Memoirs of an Agri Journalist)

WHEN WE INTERVIEWED Captain Oscar Barzaga in June 1992, he must have had the biggest number of purebred sheep in the country that he raised on a 14-hectare farm in Brgy. Langkaan in Dasmariñas, Cavite. A PAL pilot since 1969, he had more than 300 purebreds when we met him. That's in addition to his many native sheep, those that were introduced in the country many years before.

The first purebred that he bought from Australia in 1989 was the Suffolk, which produces excellent meat. The reason why he got interested in Suffolk was that when he was looking for a breeder to buy, he happened to be where the buyer of the Japanese Imperial Farm was also buying breeders. The emperor's buyer specified Suffolk, so Barzaga thought Suffolk must be good. And Barzaga was right. He found Suffolk to be a really good choice.

The Suffolk, Barzaga explained, was a fast grower, attaining 50 kilos in six months with ideal feeding. It also produces sweet lean meat. While the native female sheep (ewe) normally weighs 30 kilos at maturity, the Suffolk ewe weighs 80 kilos. The Suffolk ram, on the other hand, normally weighs 120 kilos at maturity while the native may weigh only 45 kilos.

Aside from Suffolk, Barzaga also brought in the Poll Dorset breed, a little smaller than the Suffolk but is also a fine meat type with white high-class wool. The third he got from Australia was the Border Leicester with twirling long wool. The ram of this breed is good for crossing with the native ewe and then crossing the offspring with Poll Dorset or Hampshire Down (the fourth breed he introduced) for prime lamb production.

Barzaga was fully convinced that the prospects of sheep production in the Philippines were bright. Sheep meat, he stressed, is first class meat. It is lean and has very low cholesterol. Unlike the common belief that sheep meat has an undesirable flavor, he explained that it is the meat of the old or culled sheep that has that smell. Lamb meat (eight months old) does not have any gamey taste or smell, he said.–**By ZAC B. SARIAN**

Purebred sheep grow fast.

BY JULIO P. YAP, JR.

SOYA: THE BEST ALTERNATIVE TO COW'S MILK

A NEW STUDY conducted by researchers from McGill University in Canada showed that soya milk is the best plant-based alternative to cow's milk, particularly for the lactose-intolerant.

The study was done using the four most commonly consumed types of milk beverages from different plant sources around the world: almond milk, soy milk, rice milk, and coconut milk. The researchers compared their nutritional values with those of the cow's milk, and they found that after cow's milk—which they said remains to be the most nutritious—soya milk comes out as a clear winner.

This is welcome news for the local producers of soya milk in the country, particularly the husband-and-wife team of Mer and Mary Ann Layson, who have been processing soya milk for the past several years. The Laysons can produce soya milk steadily because they have a source of their own raw materials: their own farm—located at Sitio Minangan, Barangay San Patricio in Mexico, Pampanga—which they call Layson Farms.

From their 2-hectare farm, they can organically produce about 120 sacks of soybeans per cropping—enough to supply the needs of the couple's KKK (the name is derived from the initials of their children) venture. While their business got off to a rough start in Manila, they say that the timely assistance of PhilMech helped them acquire the equipment they needed to produce their major products: soya milk, soya coffee, and soya ice candy.

Mer Layson particularly expresses gratitude to Dr. Gary Sy for the latter's invaluable information about the benefits of soya:

• It can be used as a meat protein, and is a good substitute for animal products;

• Soy protein can help balance the effects of bad cholesterol levels without impacting the levels of "good" or HDL cholesterol;

• Soy protein will not only help reduce levels of bad cholesterol over time, but will also help maintain healthy veins, and improve blood flow to the heart;

• As an energy booster, soy protein contains amino acids that can be used effectively by the body after these are converted into energy;

• It can also reduce other health risks because soy protein can apparently help prevent the development of colon and prostate cancer;

• It is useful in controlling hyperglycemia and for weight loss because the inclusion of soy protein in the diet can help balance sugar levels in the body;

• For menopausal symptoms, phytoestrogen (plant-based estrogen) acts as a synthetic estrogen that protects women from severe bone mass loss by helping keep bones strong, increasing calcium absorption by the body, and maintaining calcium balance in postmenopausal women, and helps in maintaining a healthy heart;

• It can help prevent osteoporosis as the phytoestrogen content of soy can and can help in the prevention of

(Clockwise, from above) The latest study by the researchers from the McGill University in Canada shows the soya milk is the best plant-based alternative to cow's milk. Soya ice candy by KKK. Roasted and ground soya beans can be used as a caffeine-free substitute for coffee. The Laysons only use organically-produced fertilizers and fungicide to protect their soya plantation; from the couple's 2-hectare farm, they can organically produce about 120 sacks of soybeans per cropping.

bone mass loss;

• It can encourage cell growth and regeneration because soy protein can actually 'nestle' inside your cellular structure and help in stimulating the synthesis of collagen and elastin with other proteins—these properties are vital for cell growth and for reversing the formation of abnormal cells; and

• It can help maintain healthy bones and prevent mineral loss—even men can suffer from weak bones and can benefit greatly from the consumption of soy, as soy protein can help relieve symptoms of arthritis in some cases.

On the other hand, researchers from the McGill University say that soya milk can have the most balanced nutritional profile.

Soya milk is now widely consumed for its health benefits, linked to the anti-carcinogenic properties of phytonutrients present in the milk known as isoflavones, and has been as an accepted substitute for cow's milk for about four decades.

Mer Layson added that soybeans can be used in other dairy product substitutes like soya milk, margarine, and soya ice cream. He says that roasted and ground soya beans can be used as a caffeine-free substitute for coffee. When roasted and ground, it can be used in powder form, similar to that of instant coffee, with its unique aroma and flavor.

Aside from the success attained by the couple, the KKK venture generated employment opportunities for several workers, and provided opportunities for enterprising individuals who sold KKK's soya products in their respective areas. Layson also continuously conducts free livelihood opportunity seminars where entrepreneurship and development programs are shared and discussed.

For those who would like to participate in the seminars, you may get in touch with Mer Layson through the mobile phone number 0917.867.5197.

BY JAN SUSZKIW

WHOLE GRAINS DELIVER ON HEALTH BENEFITS

ALL HAIL the whole grain!

A human nutrition study reaffirms the health benefits of substituting refined-grain products like white bread with whole-grain foods like whole-wheat bread, oatmeal, barley, rye, and brown or wild rice.

Scientists with the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA)—jointly run by the Agricultural Research Service (ARS) and Tufts University in Boston, Massachusetts—conducted the study to clarify the role of whole grains in helping regulate weight, blood sugar levels, and calorie (energy) use, among other benefits. Unlike refined grains, which undergo extensive milling or other processing, whole grains are sold for consumption with their bran and other constituents intact—all rich in vitamins, minerals, fiber, carbohydrates, and phytonutrients.

The study, published in the February 2017 online issue of the *American Journal of Clinical Nutrition*, is the first to strictly control participants' diet, weight, and type of whole-grain products they consumed, according to the HNRCA researchers and their co-authors. Previous clinical trials, they add, didn't incorporate these important study design criteria, leaving the benefits of whole-grain diets—especially on weight management—open to question.

"Epidemiological studies have previously shown that consuming whole grains is associated with better weight management, but that kind of research can't tell what is cause and what is effect," notes Susan B. Roberts, a senior author and director of the center's Energy Metabolism Laboratory. "What this study did was provide a metabolic explanation for why whole grains help weight management."

In the 8-week study, the researchers determined the weights and calorie (energy) intake needs of

Whole-grain products.

81 participants—healthy, nonsmoking men and women ages 40 to 65—and started them on a diet free of whole grains. At week 2, the researchers randomly switched some participants to diets containing the daily recommended allowance of whole grains (a minimum of 3 ounces for women and 4 ounces for men).

Besides measuring weight and waist circumference, the researchers monitored all participants' insulin and blood sugar levels, resting metabolic rates (energy expenditures while sedentary), and adherence to the whole-grain diets using specialized tests. The participants were also asked about their dietary habits and activity levels. Analysis of stool samples helped to calculate calories excreted rather than burned or stored.

Among the results, participants in the whole-grain group lost approximately 100 more calories per day than refined-grain eaters—the equivalent of walking briskly for 30 minutes, notes Roberts. Her team attributes the lost calories in the whole-grain group primarily to increased metabolic rate and increased fecal energy losses.

In a tandem study, Simin Nikbin Meydani, director of HNRCA's Nutritional Immunology Lab, led a team in comparing the dietary effects of whole or refined grains on certain types of immune system cells, changes in populations of intestinal microbes, and concentrations of cytokines—proteins that can serve as markers of inflammation in the body. Inflammation is associated with cardiovascular disease,

At HNRCA, Energy Metabolism Laboratory director Susan Roberts (left) and nutrition technician Wintlett Williams prepare and measure food for study volunteers.

Roberts holds the whole-grain foods used in the study.

type 2 diabetes, and certain cancers.

With this study, "We wanted to see if whole-grain consumption—under conditions where food intake was controlled and weight was maintained—would impact gut microbiota and the ability of immune cells to fight against infection as well as produce inflammatory markers," says Meydani. "We found that whole grains, even in the absence of a significant difference in weight, have a modest effect on gut microbiota, which could be beneficial in terms of reducing inflammation and improving immune response to pathogens. Related to that, we observed that participants in the whole-grain group had cytokine levels similar to those of the refined-grain group but slightly higher number of immune cells involved in defense against pathogens—notably of infection-fighting memory T cells."

At HNRCA, graduate student Mitra Rozati prepares samples for immune system assessment.

Specifically, the whole-grain diet gave a moderate boost to populations of beneficial *Lachnospira* bacteria, which make protective short-chain fatty acids and help counteract another bacterial species that contributes to inflammation. Such gut bacteria comprise a larger community of microorganisms, called the microbiota, that live on or in the human body. They are of increasing interest to scientists for the diverse and often beneficial roles they play, including helping digest food, extract nutrients, regulate metabolism, and protect against disease and infection, among others.

The researchers note that their study used products made from whole-grain flour and one type of grain, and that consuming intact whole grain kernels or a mixture of grains may confer even greater benefits than those they observed. In addition, the weight loss that is associated with consuming more whole grain, often observed under uncontrolled conditions, might have additional impact on gut microbiota and associated biological changes, such as those of the immune response.

HNRCA research assistant Linjun Li uses a pipet to prepare samples for identification of intestinal microbes and concentrations of cytokines. *(Photos by Deb Dutcher)*

The take-home message, says Roberts, "is that whole grains are carbohydrates we can feel good about eating for health as well as enjoyment." **(ARS News Service)**

BY ANGIE M. VENERACION

SAN JOSE, TARLAC ENGAGES IN RABBIT PRODUCTION

SAN JOSE, TARLAC is a quiet, beautiful town with very rich natural resources. It was once a part of the municipality of Tarlac City and was created into a separate municipality in 1990. It is the largest municipality of Tarlac Province in terms of land area but is among the smallest in terms of population.

The third class municipality's development was disrupted by peace problems, as it was once caught in the crossfire between rebels and government forces. This conflict ruined their agricultural facilities and slowed down the delivery of basic services. And so the residents took the initiative in forming a local peace committee that worked for the declaration of San Jose as a zone of peace, to be protected by its own people from violence, intimidation, and terrorism of all kinds. This committee also exercises vigilance in the protection of the town's natural resources and environment.

Personal commitments: Engineer Ramil de Vera and Romy Capitulo (now the town administrator), being advocates of local peace building and the conservation of the environment and natural resources, were among the initial peace committee members. When Capitulo was elected vice mayor, he convinced de Vera to join the local government to better pursue his advocacies. Given the task of working with the Environment Management Bureau (EMB), whose mission is to restore, protect, and enhance environmental quality towards good public health, environmental integrity, and economic viability, de Vera took on the challenge and set aside his lucrative business as contractor.

De Vera also administers Mayor Jose Yap Jr.'s Tourism and Environment Projects. He is also Local Economic and Investment Promotions Officer (LEIPO). Among his multiple tasks is to pinpoint economic projects that will improve the plight of the populace particularly the farmers, the town being mostly agricultural.

Working with what's available: San Jose's large land area is hilly and mountainous, and vegetation is

Municipal engineer Ramil de Vera also administers Mayor Jose Yap Jr.'s Tourism and Environment Projects and also serves as Local Economic and Investments Promotions Officer (LEIPO).

Art (left) and Angie (right) Veneracion with municipal administrator (MA) Romy Capitulo and Engr. de Vera when they visited San Jose, Tarlac to see the town's rabbitry setup.

Engr. de Vera together with other participants intently listen to Veneracion during the rabbit production seminar at AVEN Nature's Farm.

De Vera with the Veneracions and his Rabbit Production Seminar batchmates.

predominantly grasslands and forest trees with scattered vegetable plantations and fruit trees. In looking for suitable livestock to complement the town's agricultural produce, de Vera found raising rabbits to be suitable. Capitulo, who had always wanted to put up his own rabbitry, introduced him to Art Veneracion of AVEN Nature's Farm.

De Vera, together with the staff he appointed to care for the rabbits, attended the Rabbit Production Seminar conducted by Veneracion at AVEN Nature's Farm. The seminar confirmed that rabbits were relatively easy to care for and could be handled by women and even children. It can thrive on forage, which is readily available in San Jose. The animal only needs a small space; is relatively odorless; and very quiet, making it suitable for rabbitries to be located even in residential communities.

Rabbits can be butchered at home, so their protein will be readily available to the farmers' families. The meat will just be enough for the day's meals, and a refrigerator will not be needed to store excess meat. A diet featuring its nutritious meat will certainly help lead to a healthier populace.

In addition, the rabbit is the most environment friendly livestock, with the least gas emissions and smallest carbon footprint compared to other livestock. It can provide the farmer with prime fertilizer with its cold manure, which can be used even without drying. It will also complement the town's vermiculture project, as rabbit manure provides good feed for the African Night Crawlers (ANC).

With these advantages in mind, de Vera presented the rabbit project proposal to the EMB. The Bureau found merit in the proposal and decided to

The rabbit project's foundation stock was procured from AVEN Nature's Farm.

The rabbits are housed at the back of the MRF, very near the town's wet market.

The open area near the MRF was planted with Dragon fruit that will be fertilized with rabbit manure.

San Jose, Tarlac's initial rabbit breeders and its standard rabbit cages supplied by AVEN Nature's Farm. Rabbit cages were placed on top of the vermicomposting bins.

African night crawlers (ANC) feed on rabbit manure.

Archie Veneracion demonstrates the installation of automatic water drinkers. These automatic drinkers make clean water always available and makes caring for rabbits easier.

fund the pilot "rabbit project." They found it interesting that this livestock could be used as an innovative component in the town's Materials Recovery Facility (MRF). Foundation stock was immediately procured from AVEN Nature's Farm and the rabbitry housing was built at the back of the MRF, near the town's wet market.

The vegetable discards from the market can be utilized as feed for the rabbits, while the rabbits will be housed in cages on top of vermicomposting bins, where the ANCs will feed on the rabbit manure. De Vera also had the open area near the MRF planted with dragon fruit. This will serve as a demonstration site for growing dragon fruits organically using rabbit manure as fertilizer.

Other local government agencies, including the Commission on Audit (COA) are also interested to see the project and are looking into adopting it on a larger scale. De Vera is very enthusiastic about the rabbit project and finds caring for the rabbits to be a stress reliever. He even brings his family to the community rabbitry on weekends for family bonding. His three children, aged 10-14, enjoy feeding the rabbits and do not find

Engr. de Vera with Art and Archie Veneracion.

the chore tiring at all.

It is apparent, with the presence of wide roads and bridges, that the town is not wanting in infrastructure development, and is fast moving from being a sleepy town to a progressive one. San Jose is directly benefiting from Tourism Road Projects, with national roads in the area currently undergoing road reblocking and widening.

Being the site of Monasterio de Tarlac, located in Barangay Lubigan, the town has become a favorite agritourism destination for tourists from adjacent towns and nearby provinces. San Jose is rapidly becoming a haven for adventure seekers, sports enthusiasts, and nature lovers.

De Vera is optimistic that the demand for rabbit meat will increase with the increased tourist arrivals in San Jose. He sees the rabbit dishes as culinary attractions for tourists in addition to agritourism. With everything falling into place, the rabbit will certainly play a role in the town's progression from a third class to a second class municipality.

Center of the town's activities, the San Jose Sangguniang Bayan building and the Engineering building.

Wide roads and bridges lead to the municipality of San Jose, Tarlac.

BY MA. NOVA R. NGUYEN

SOIL MANAGEMENT STRATEGIES TO INCREASE VEGETABLE PRODUCTIVITY

VEGETABLE PRODUCTIVITY in most parts of southern Philippines is hampered by low nutrient availability in the soil. Overapplication of mineral fertilizers and application of unbalanced nutrients are also major concerns in vegetable production. These fertilizer use practices take a large share of the total cost of production inputs.

A project addresses these concerns through research activities that have been ongoing since 2014.

Titled, "Soil and nutrient management strategies for sustainable vegetable production in southern Philippines," the project compares the productive capacity, soil fertility, and economics of conventional, organic, and protected vegetable production systems in southern Philippines. Initiatives are also in place to identify key soil and nutritional constraints to vegetable production.

The project has identified the optimal rates of nitrogen that can be applied to peppers and eggplant for conventional production. In the organic production system, the optimal rates of chicken dung that can be applied have been determined, with eggplant as the test species. These findings will aid in assessing the economics of organic and conventional vegetable production systems and will contribute in maximizing yield.

Changes in soil fertility under conventional, protected cropping and organic systems are also being observed. Nutrient schedules (budgets) along with nitrogen and phosphorus levels in conventional and protected cropping systems are being compared in experiments. Findings will be used to develop improved and targeted site-specific nutrient management strategies.

Through the project, key constraints in vegetable production systems have also been identified through surveys in Leyte, Claveria, Bukidnon, Bohol, and Samar. Interviews with 91 vegetable farmers from said areas confirmed that poor soil fertility is perceived as a major constraint and main driver in the overapplication of fertilizers, which unnecessarily raises input cost.

As part of the project's capacity building efforts, ten Filipino project team members were trained in Australia. The training included laboratory-based studies and covered field experimental sites, commercial farming operations, and landscape production issues. Twenty-five farmer-cooperators from Samar, Leyte, and Bohol also underwent training on "Soil fertility assessment for improved crop nutrient management in vegetable production," which was led by Landcare Foundation Philippines, Inc. in partnership with Visayas State University (VSU).

The team seeks to develop, publish, and disseminate soil and nutrient management strategies and materials for profitable smallholder vegetable production by the end of its implementation in 2018.

These efforts, among many others, are expected to contribute in reducing input costs of farmers and increasing crop yield.

The project is funded by the Australian Center for International Agricultural Research (ACIAR) and co-monitored by the Department of Science and Technology-Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST-PCAARRD).

The project is being implemented by researchers from the Visayas State University (VSU), Bureau of Soils and Water Management, University of the Philippines Los Baños, and Landcare Foundation of the Philippines, Inc. in partnership with the University of Queensland and Queensland Department of Agriculture, Fisheries and Forestry. It is focused on the priority areas of Leyte, Northern Mindanao, and Bohol, and selected vegetable crops including tomato, bell pepper, eggplant, squash, and cabbage.

Project activities are aligned with the main goal of the program, "ACIAR-PCAARRD Horticulture Program on Fruits and Vegetables Phase 2," to improve food security and livelihood of farmers in southern Philippines, with the soils project being one of its ten components. **(DOST-PCAARRD S&T Media Service)**

DA LAUNCHES 'TINDA SA PAROLA' IN ILOILO

AIMING TO CONNECT FARMERS directly with consumers, the Department of Agriculture (DA) Regional Field Office recently launched the 'Tinda sa Parola' and 'Bugas para sa Masa' on at the DA Regulatory Compound in Parola, Iloilo City.

"We wanted to reduce the layers of traders and middlemen who control the price of agricultural products before it reaches the consumers. We hold this Tinda sa Parola as our commitment to Secretary Manny Piñol who, together with President Rodrigo Duterte, launched the TienDA para sa mga Bayani last month at Camp Hernandez in Dingle, Iloilo," said DA regional executive director Remelyn Recoter.

Fresh and organically grown fruits and vegetables, rice, dried fish and other agri-fishery products from different towns across the region were sold at farmgate prices during the fair. "Both farmers and consumers can benefit from this new marketing concept. Consumers could save ₱4 to ₱8 as price difference when they buy agricultural products here," Recoter noted.

In Dingle, there is a huge difference in price range between the farmgate price and market buying price of agri-products, according to municipal agriculturist Marfe Quinlat. "Traders are buying banana for only ₱10 per kilo from the farmers, but they are selling it for ₱25 in the public market in Dingle. Thus, we are holding this Tinda (sa Parola) to capacitate our farmers in increasing their [incomes] when they sell their products directly to the consumers," explained Recoter.

DA Agribusiness and Marketing Assistance Division chief Maria Teresa Solis mentioned that this Tinda sa Parola will be conducted twice every month. "With our provincial government partners, we are also going to conduct the same activity twice a month in all provinces in Western Visayas."

Onion and garlic growers of Miagao, Iloilo will be invited to the next Tinda sa Parola. "We have provided them [with a] ₱20 million loan fund under the Production Loan Easy Access program. And we are going to assist them in the marketing," said Recoter.

Alongside Tinda sa Parola, the DA also conducted the 'Bugas para sa Masa' where consumers can buy rice at affordable prices. The agency partners with the Dingle Multi-Purpose Cooperative (formerly known as FACOMA) in the program, where consumers can buy rice for only ₱34 to ₱38 per kilo. The Cooperative, as a recipient of the Rice Processing Center from DA, handles and assists rice farmers in the production, harvesting, drying, milling, and marketing of their produce.

Recoter assured the public that there is no rice shortage in the region. "Western Visayas is 124 percent rice self-sufficient. All provinces, except for Negros Occidental, are more than 100 percent sufficient. In fact, farmers now are enjoying the buying price of palay [which is at] ₱17 to ₱22 [per] kilo."

DA also featured the Rice and Corn Blend as the new health and wellness staple food for the Filipinos. "Bigas Mais (Rice and Corn Blend) is one of the strategies of DA to reduce the pressure on the rice industry. This rice and corn blend is a healthier choice for rice eaters since corn has [a] higher vitamin content and is slower to digest," explained Recoter.

Rice and corn blend is sold for only ₱35 per kilo. It comes in three variants, the regular with 70 percent rice-30 percent corn, special rice 50 percent rice-50 percent corn, and the premium with 30 percent rice-70 percent corn.

The Dingle MPC, Alimodian Vegetable Growers Association, Estancia Stall Owners Association, Vegetable Growers Association of Tubungan, Mapili Farmers Association of San Enrique, Leon Vegetable Growers Association, San Dionisio Multi-Sectoral Integrated Association, Island Marketing in Guimaras, Ruzyll's Food Products, Zarraga Vegetable Growers Association, and the Philippine Carabao Center at WVSU-Calinog took part in the launching of Tinda sa Parola. They generated a total sales of ₱135,576.00. **(Sheila Mae H. Toreno-DA 6 Information)**

PRODUCT ELIMINATES ODOR OF YOUR PET DOG'S POOP

A NEW FORMULATION of enzymes and beneficial microbes can effectively eliminate the undesirable odor of a pet dog's poop and urine. Called "Fedgrozyme," it is a new product released to the market by Novatech, a company that produces organic fertilizers (granules, pellets, and liquid) and other probiotic formulations for use with livestock and poultry production and in aquaculture.

Dr. Ronaldo Sumaoang, a microbiologist who heads Novatech, explains that a pet's gut is not that efficient in digesting the feed that it eats, usually resulting in poop with many undigested feed materials. The strong odor from the pet's poop is usually caused by decomposing bacteria that feed on the undigested proteins, fats, oils, and other feed components.

"By introducing Fedgrozyme to your pet's favorite feed, you are introducing high-performing enzymes and beneficial microbes that help your pets break down and absorb most of these proteins, fats, oils, and other materials, resulting in drier and odorless poop and urine," Dr. Sumaoang explained.

Fedgrozyme is a free-flowing stabilized source of highly potent digestive enzymes of microbial origin for pets, including cats. Aside from eliminating the irritating smell, the product also improves the overall health of the animals. That's because the dogs and cats can more efficiently absorb the nutrients in their feed.

Dr. Sumaoang said that Fedgrozyme is very economical to use. For small pets, place only one to two pinches (0.5 gram to 1 gram) on top of the pet's food every meal. For big pets, the dose is 2 to 4 pinches (1 to 2 grams) on top of the pet food every meal.–**ZBS**

Fedgrozyme in a small container weighing 250 grams.

Emma Gonzales showing a one-kilo pack of Fedgrozyme in a plastic container.

BY KIM KAPLAN

ARS SCIENTIST LEADS US$1 MILLION FUNDED CONSORTIUM TO SEEK HONEY BEE DISEASE CONTROLS

The deadly parasitic Varroa mite on the back of this honey bee is one of the many insect pests that sugar esters may be useful in controlling. Sucrose octanoate, a sugar ester, can kill the mite without harming the bee. *(Photo by Scott Bauer)*

AGRICULTURAL RESEARCH SERVICE (ARS) entomologist Steven Cook will be leading a US$ 1 million funded international consortium of scientists to seek new controls for Varroa mites, honey bees' number one problem.

Cook, with the Bee Research Laboratory—a part of ARS's Beltsville (Maryland) Agricultural Research Center—will be the principal investigator of a group that will include scientists from the United States, Canada, and Spain. ARS is the in-house research agency of the U.S. Department of Agriculture (USDA).

The researchers will be screening a variety of chemical compounds for their ability to control Varroa mites with minimal damage to honey bees on an individual and colony level. Laboratory and field studies will be conducted at facilities in Alabama, Georgia, Maryland, and Ohio, as well as in Alberta, Canada. In laboratories in Nebraska and Spain, scientists will also be using advanced methods to work out an understanding of the molecular mechanisms by which Varroa mites develop resistance to various chemical controls.

Improving knowledge of such mechanisms would provide a better guide to researchers and narrow the field in the future for selecting chemicals worth screening as new control agents for Varroa mites.

The largest single grant for this project is an award of US$ 475,559 to Cook from the Pollinator Health Fund, which was established by the Foundation for Food and Agriculture Research (FFAR) in response to the agricultural threat posed by declining pollinator health. Other funding is coming from participating universities, Project Apis m., and in-kind support from a number of regional beekeepers.

The Honey Bee Health Coalition, a diverse network of key groups dedicated to improving the health of honey bees and other pollinators, will also provide their expertise to facilitate the researchers' efforts.

Insect pollinators contribute an estimated US$ 24 billion to the U.S. economy annually, according to the FFAR. Honey bees specifically pollinate about 100 crops in the United States. Varroa mites have become resistant to many commercially available chemical control agents in recent years. **(ARS News Service)**

BY JULIO P. YAP, JR.

TECHNO-FORESTRY INITIATIVE BENEFITS REMOTE VILLAGERS

IN A REMOTE, waterless, and powerless barangay of Kabankalan City in Negros Occidental, a techno-forestry project was launched with the intent of providing livelihood opportunities for a farmer.

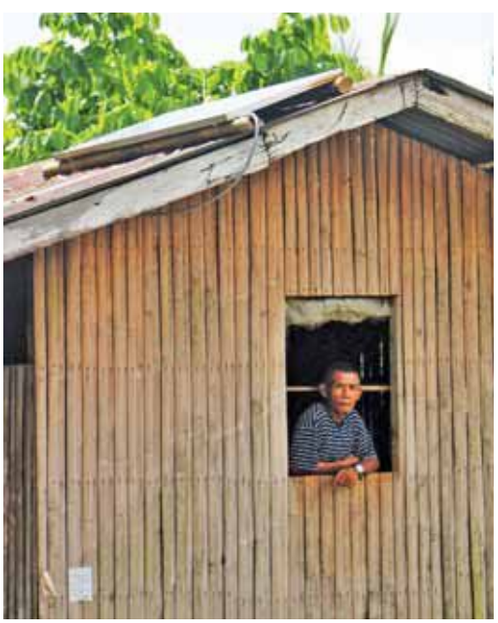
The project was realized following an agreement made between the Central Philippines State University (CPSU) in Kabankalan City; the Ecological and Agricultural Development Foundation, Inc. (Eco-Agri) in Bacolod City, which was represented by R.U. Foundry and Machine Shop Corporation (RUFMSC) chairman-of-the-board Ramon Uy Sr.; and farmer Nestor Obejero of Sitio Cabugan in Barangay Tagukon, a remote community in Kabankalan City.

According to CPSU professor Aladino Moraca, the objective of the project is to provide opportunities to deserving farmers who have shown dedication in the promotion and practice of organic farming and biodiversity conservation. Since Obejero has been observed to have the ability to lead community organizations, and has influenced the other farmers to adopt his organic farming practices, he was chosen as the first beneficiary of the project.

The components of the project include a solar home system which can provide the basic power needs of a home located in a remote area, and a rainwater collector which can store and provide the basic water requirements of a small family.

"This is a simple transfer of technology to the targeted farmers regarding coconut oil processing, natural muscovado sugar production, and processing of other farm products, which is part of the advocacy of CPSU, particularly its College of Agriculture and Enterprise Development Unit, to provide technical support in the development of Organic Farming and Agritourism, adopting the Climate Smart Agriculture Practices," Moraca explained.

The implementation of projects similar to this techno-forestry initiative is expected to help the residents of other remote communities become productive and encourge them to make their operations sustainable. Moraca says that this is actually a trade-off in the



Nestor Obejero inside his hut.

Obejero shows the flowing water from the rainwater collector tank installed at his hut.

RUFMSC and Eco-Agri chairman of the board Ramon Uy Sr. (center) together with Obejero, Aladino "Nonoy" Moraca (right), and other officials join hands after signing the Memorandum of Understanding (MOU) for the project.

Uy Sr. shared his advocacy during the MOU signing.

Obejero and Uy Sr. while signing the Memorandum of Understanding.

Uy Sr. shakes the hand of Obejero as a sign of mutual support for the success of the initiative.

Moraca discussed the salient features of the project by using a laptop and an audio-visual unit powered by electricity coming from Obejero's home solar power system.

sense that Obejero is committed to conserve and maintain at least a hectare of forest patch in the surrounding area where spring sources are available.

Aside from the solar facility and water collection system, Obejero, together with the other members of his family, also received coaching on how to produce organic muscovado sugar, and on extracting cooking oil from coconuts. Moraca says that with these simple lessons, Obejero's family will have the chance to save their hard-earned resources by removing the need to buy commercially-produced cooking oil and sugar.

Moraca said that the CPSU partnered with Eco-Agri due to its shared objectives and the company's expertise in implementing organic agriculture and community programs and projects, adding that Eco-Agri's advocacy can be a worthwhile project which can be replicated in other communities in partnership with academic institutions like CPSU.

Students from the CPSU prepare to demonstrate how to process cooking oil from coconut and how to naturally produce muscovado sugar.

Obejero keenly observes how to produce muscovado sugar.

Two elderly members of the remote community attentively listen to the remarks of the project proponents.

It was learned that Eco-Agri, through RUFMSC, was tapped in the implementation of the techno-forestry project particularly due to its competency in the installation of solar home systems, and rainwater collectors being among its services to alleviate poverty in the countryside.

For his part, Obejero expressed his gratitude for the project where he was chosen as the first beneficiary in his remote community. He shared that the power generated from the solar system provides the electricity needed to light their home at night, which helps their children study.

Obejero said this during a simple turnover ceremony which was recently held at the community's small multi-purpose hall that was attended by local residents, students of the CPSU's Agribusiness, Crop Science, and Sugar Technology departments, representatives from the Office of the Provincial Agriculturist, Multi-Sectoral Alliance for Development-Negros (MUAD-Negros) which was represented by its executive director Reynic Alo, and other local and barangay officials.

Following the turnover ceremony, a demonstration of the actual cooking and processing of coconut oil was done, followed by another demonstration of the making of natural muscovado sugar and powdered turmeric production for the benefit of Obejero's family and some members of the remote community.

The CPSU will be providing scholarship grants to Obejero's children to help them complete their college education.

This is the modest home of Obejero where the solar power system and rainwater collection facility was installed.

Uy Sr. and Moraca, together with other project partners and guests, during the turnover of the project to Obejero.

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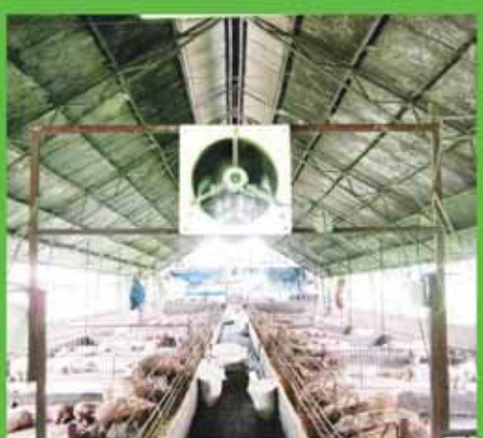

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