

PHilMech

Official Newsletter of the Philippine Center for Postharvest Development and Mechanization

CORN GRITS:

NEXT TO RICE, NEXT TO RISE



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COVER



The development of efficient corn mill is expected to increase the consumption of corn grits in the country.

APEC strengthens PPP to reduce food losses

Member-economies of Asia-Pacific Economic Cooperation (APEC) convened on September 27 at Iloilo City, Philippines to discuss the APEC Multi-Year Project (MYP) entitled “Strengthening Public-Private Partnership to Reduce Food Losses in the Supply Chain.” The theme of the MYP seminar focused on the fishery and livestock products and was hosted by the Council of Agriculture of Chinese Taipei in collaboration with the Philippine-Department of Agriculture and Ministry for Primary Industries of New Zealand.

About 80 delegates from both public and private sectors exchanged information on basic research, current trends, business models, and postharvest technologies in the fishery and livestock industry during the one-day seminar. Foreign delegates came from Chile, People’s Republic of China, Japan, New Zealand, Papua New Guinea, Peru, the Philippines, Singapore, Chinese Taipei, Thailand, the United States, and Vietnam.

According to Ms. Dong-Chong Hsiou, Deputy Director General-Department of International Affairs, Council of Agriculture of Chinese Taipei, “The seminar will generate more creative and innovative ideas and solutions. We will review the current status and future perspectives of reducing postharvest losses.”



Experts from the 21 APEC economies convene to exchange ideas and technologies to reduce food losses in fishery and livestock.

“Seventy percent of the hungry populations are living in the Asia Pacific region...” Dr. Feng Dongxin, the lead shepherd of the APEC Agricultural Technical Cooperation Working Group said.

“Food loss and waste are growing concern of all economies which has to be addressed and given importance especially with the fact that according to studies, one-third of the total food production goes to food loss and waste. Because of the growing number of the global population and the significant figure of hunger incidence, there is a need

to ensure sufficient supply of affordable, safe and good quality food,” DA-PHilMech Executive Director Rex L. Bingabing emphasized.

The output of the seminar will be discussed and delivered to the APEC High Level Policy Dialogue on Food Security and the Blue Economy (HLPD-FSBE) and other fora.

Iloilo City hosted the HLPD-FSBE also known as the Food Security Week from September 27 to October 6. At least 900 delegates from the 21 member-economies participated in different meetings.

VBCaliguiran

PHilMech showcases new technologies at 11th agri, fisheries forum

The PHilMech showcased anew mechanization and postharvest technologies at the 11th Agriculture and Fisheries Technology Forum and Product Exhibition held at the SM Megamall, Megatrade Hall 2, Mandaluyong City on August 7-9, 2015.

This year's theme "*Teknolohiyang Pangsakahan at Pangisdaan: Tulay sa Mas Maunlad na Pilipinas Patungo sa Pandaigdigang Kakayanan,*" highlighted the global competence of the Philippine products and technologies generated from research and development (R&D).

PHilMech, being the primary arm of Department of Agriculture on postharvest and mechanization R&D programs, showcased the newly developed technologies such

as mango peel as source of pectin, fuel briquettes, soya sorter, mechanical grain stirrer for flatbed dryer, onion seeder, coffee pulper, rice planter, combine rice harvester, cassava digger, corn mill, and brown rice huller.

More than 150 guests visited the PHilMech exhibit area. They expressed interest in the different postharvest technologies. Ms. Milagros Cacal of DA-PAES, said that Palawan is willing to be a cooperator for soybean technologies. Leonardo Florece of UPLB-SESAM was interested on the flatbed dryer, and Ronald Pena of CavSU-NCRDEC, Indang Cavite was interested on coffee pulper and hermetic storage.

The event is a yearly project of the Bureau of Agricultural Research. It aims to give

importance to the R&D breakthroughs and provides new perspectives on technology commercialization in the field of agriculture and fisheries. It also establishes and strengthens linkages and networks with the private sector, non-government organizations, local government units, other government agencies, state colleges and universities and even with international organization in terms of product marketing.

Agriculture Secretary Proceso J. Alcala led the public in the opening of the exhibits. Some prominent leaders in the agriculture industry graced the affair. Ribbon cutting was led by BAR Director Nicomedes P. Eleazar with Director General Dr. William D. Dar of the International Crops Research Institute for the Semi-Arid-Tropics. Senator Cynthia S. Villar, chairperson of the Committee on Agriculture and Food, also served as the keynote speaker.

The event was participated by 93 exhibitors from Regional Field Offices (RFOs), Bureau of Fisheries and Aquatic Resources Regional Offices (BFAR-ROs), state universities and colleges (SUCs), international partner-institutions, R&D institutions, private sector, and other R&D stakeholders and universities, Department of Agriculture (DA) attached agencies and regional offices nationwide. **IDCDavalos**



This newly developed cassava digger was one of the technologies showcased during the Agriculture and Fisheries Technology Forum and Product Exhibition.



Couple leads awardees at regional invention contest

Is it in the family? Or is it in the agency they belong? Where lies the secret of their winning streak with R&D pursuits?

Dr. Michael Gragasin and Dr. Ma. Cristina Gragasin, husband and wife, and both Supervising Science Research Specialist at PHiMech, won in different award categories during the 2015 Regional Invention Contest and Exhibits. The Department of Science and Technology (DOST)-Regional Office III conducted the contest and exhibit at the Walter Mart San Fernando, San Agustin, City of San Fernando, Pampanga on Aug. 24-25, 2015.

Dr. Michael Gragasin, along with his team members, Dr. Romualdo Martinez and Jayvee P. Illustrisimo, won in the Most

Creative Research category. Their winning invention – PHiMech Compact Cornmill. The technology answers the lack of available cornmill in the country which produces good quality corn grits, one of the staple food of the people.

According to Dr. Michael, this cornmill is easy to operate with push button switches. It can do degerming, milling and sorting of corn grits simultaneously. Its milling capacity is 250 kg/h. Its output capacity is 240 kg/h. It has a low operating cost of Php 1.40 per kg output.

Meanwhile, Dr. Ma. Cristina B. Gragasin and fellow researcher, Engr. Aileen Ligisan, won in the Utility Model category for their invention – pharmaceutical grade pectin from mango peels.

Pectin has many applications. It is used as ingredient and component in food, cosmetics and pharmaceuticals. According to Dr. Cristy, this technology can help reduce the country's importation of pectin, save on dollar reserves and help in the mango peels waste utilization.

MBGonzalez

In photos: (L-R) Dr. Michael Gragasin and Dr. Ma. Cristina Gragasin together with their major research outputs.



The members of the Bag-ayan Bakidan Indegenous Peoples Organization, Inc. of Daguioman, Abra received the certificate of turnover of coffee processing equipment from DOST-CAR, DA-RFO-CAR and DA-PHiMech.

CAR coffee growers receive PHFs

"Agyaman kami. . . kin ikarkarag mi nga adu pay kuma ti maturungan. . . (Thank you . . . and we pray that more people could be helped.)"

This was the gratitude response of Cordillera Administrative Region's (CAR) coffee growers in receiving the postharvest facilities for processing Arabica and Robusta coffee during the turn-over ceremony at the Supreme Hotel, Baguio City on July 19, 2015.

Among the recipients are the Sadsadan Advocates for Social Development from Bauko, Mt. Province, Bag-ayan Bakidan Indigenous Peoples Organization, Inc. from Daguioman, Abra, LGU of Calanasan, Apayao, Hinluyasirib Arabica Producers and Roasters Cooperative from Kaingan, Ifugao and Tuba Benguet Coffee Growers Association, Inc. from Tuba, Benguet.

Distributed technologies include coffee pulpers (rubber or steel bib), hullers (rubber or steel), moisture meters, roaster machines, grinders, multi-purpose grains solar speed trays, super grain bags and rolls of UV plastic.

For the recipients, the waiting was over for the development of coffee industry in the region. Nancy A. Bantog, assistant regional director for Technical Services of DOST reiterated this point, "The fruit of our patience came true. Finally. . . at long last. . . this is it!"

With this, Dr. Bantog related how the coffee growers got organized and how the proposals for the postharvest facilities were crafted two years ago. Also, she said the coming together of the different agencies "solidifies the commitment of the government" to help coffee growers.

PHiMech Deputy Director Raul R. Paz recognized the role of partnership among coffee growers, local government units, DA-CAR and DOST-CAR in promoting organic agriculture and in making coffee of CAR a viable enterprise and a sustainable industry. Activities that are being conducted are towards the improvement of the coffee industry in the area.

Director Paz cited organic coffee as one of the commodities being promoted by the National Organic Agriculture Program. He said, "The need to promote organic agricultural products (such as coffee) is for the betterment of the consumers. (It is) for safety and healthy consumption of food. It contributes to the preservation of the environment because of the use of nonchemical

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PHilMech trains organic coffee producers

The Philippine Center for Postharvest Development and Mechanization (PHilMech) conducted two batches of training course on the “Mechanization and Postharvest Technologies for Organic Coffee.” The training course aimed to enhance the capability of coffee farmers in the country to produce organic coffee through proper mechanization and appropriate postharvest technologies. It was held last July 11 to 16, 2015 and September 1 to 4, 2015 in Baguio City and Bacolod City, Negros Occidental, respectively.

Eighty organic coffee agriculture practitioners and recipients of coffee equipment given by the Department of Agriculture under the Organic Agriculture Program participated on the said trainings. Participants also include technical staff, officials and, Department of Agriculture-Regional Field Office, Department of Science and Technology (DOST), Provincial Local Government Unit (PLGUs), and Municipal Local Government Units (MLGUs) from various provinces of Luzon and Visayas.

The equipment received by the participants were coffee rubber-roll huller, coffee steel huller, rubber-bib pulper, coffee roasting machine, coffee grinding machine, moisture meter for coffee, UV plastic, multi-purpose solar-speed drying trays, and super grain bag.

“With the new equipment, knowledge and skills gained is the beginning of a bigger challenges for our organizations,” Mr. Patrick Polpog, one of the participants said. Participants who are involved only

on green beans production added that they were inspired to expand as coffee processors.

“We are willing to take risk for organic production of coffee to be successful, thus, let us continue on this venture. There are various government programs to help farmers which indeed a great help. Let us take the opportunity wisely,” Mr. Ramon Uy Jr., President of Organic na Negros Retailers Association (ONOPRA) and advocate of organic agriculture.

Likewise, PHilMech Deputy Director, Engr. Raul R. Paz challenged and encouraged the participants, “The training has ended, however, it is the beginning of bigger challenges. So let us continue together to

work for the development of the agriculture industry in our country...”

PHilMech-technology generators Dr. Renita Dela Cruz, chief science research specialist of the Socio-economics and Policy Research Division, and Engr. Rodelio Idago, science research specialist and PHilMech-alternate focal person on Organic Agriculture served as the subject matter specialist. Experts from the Department of Science and Technology-CAR and Region VI, Benguet State University, DARFU VI, Grain Pro, Café, Maleng-ag, Tuba Benguet Coffee Growers Association, RU Foundry, and ONOPRA were also invited to share their knowledge, expertise and experiences. **SBBanglig**





All About Corn

TREATS

The two most common types of corn are the sweet corn and the field corn. The sweet corn are those eaten by humans. The field corns are those used for livestock feeds, alternative fuel, alcohol, solvents and fibers. There is also the specialty corn. This type includes the colored kernels, popcorn and those corn bred for high levels of certain nutrients.

Tips

Buying and Storing Corn

Choose corn ears with fresh looking, green husks. The silk should be golden brown and free of decay. Kernels should be tender, plump and milky when pierced and they should fill up all the spaces in the rows. Keep unhusked fresh corn in refrigerator until ready to cook. Wrap in paper towels and place in plastic bag. Shelf life is four to six days.

Source: www.kentucky.com

Source: www.wisegeek.org



Recipe

Fiesta Corn Salad

Ingredients: 1 can whole kernel corn (drained), 1 cup chopped fresh tomato, 1 cup chopped cucumber, ½ cup chopped celery, ½ cup diced green or sweet red pepper, 2 green onions (sliced), ½ cup bottled Italian salad dressing

Procedures: Combine all ingredients. Chill several hours before serving.
Yields four to six servings.

Source: www.tasteofhome.com/recipes/fiesta-corn-salad
Photo: www.tthenymelrosefamily.com



Equipment



Advisory

Eat your white corn

One large ear of white sweet corn contains 113 calories and 1.64 grams of fat. It contains 3.1 grams of dietary fiber, 7.2 milligrams of Vit. C, 292 milligrams of potassium. An ear of white corn also gives the body niacin, iron, magnesium and folate. So eat your white corn for better health.

Source: healthyeating.sfgate.com/health-white-sweet-corn-3536.html



Trivia

Did you know that...?

- An ear of corn, on the average, has 800 kernels arranged in 16 rows.
- For every kernel of corn on the cob, there is one strand of silk.
- There are over 3,500 different uses for corn products.

Source: www.sciencekids.co.nz/science_facts/food/corn.html



Selection

Selected corn vocabularies

Confused with corn vocabularies like corn grits, corn meal and corn flour? Here are their meanings. Corn grits is a term for coarse, ground corn. Corn flake cereals are made from white corn grits. Corn meal is a coarse flour ground from dried corn. Corn flour is also ground from dried corn but the corn flour is ground to a much finer texture than the corn meal.

Source: www.foodreference.com/html/fgrits.html | www.food.com/about/corn



Compact Cornmill

The PHilMech compact corn mill which can produce good quality corn grits is now commercialized. Accredited manufacturers for this technology include the ACT Machineries and Metal Craft Corp and the Rollmaster Machinery and Industrial Services, Corp. Easy to transport, has a higher milling recovery and sorts different sizes of corn grits, the compact corn mill can simultaneously degerm, mill and sort corn grits. With a milling capacity of 250 kg/hr, its output capacity is 160 kg/hr. Degerming efficiency of the corn mill is 91.45 percent.



PH DEVELOPMENT PLAN

Bukidnon

Located in the central part of Mindanao, Bukidnon is endowed with deep ravines and forest mountains. This landlocked province has a cool climate owing to its fairly high altitude. It boasts of natural scenic attractions like the Mt.Kitanglad Range, Mt. Musuan, Lake Apo, Kaamulan Tree Park, and the Dahilayan Adventure Park, among others.

Bukidnon is home to Indigenous Peoples (IPs). It also provides habitat to the Philippine Eagle and Rafflesia, the world's giant flower.



Agricultural Profile



Bukidnon is known as the region's "Food Basket". It is a major producer of corn, rice, mango, cutflowers, tomato, and other fruits and vegetables. Sugar, coffee, pineapple and rubber are also grown.

Postharvest Situationer

High postharvest losses of its major crops is a major concern of the agriculture sector. Thus, postharvest interventions have been proposed by the industry stakeholders. Among these interventions include the provision of postharvest facilities and infrastructure; training, extension and commercialization; and support policies and programs.

Proposed Postharvest Projects

The lack of postharvest facilities is one of the root causes of high postharvest losses of the farmers' harvest in Bukidnon. The following postharvest projects have been proposed to cut on these losses and contribute to the agricultural development of the province. This includes the establishment of postharvest facilities like:

- Farmer's service center for rice and corn,
- Mini feed mill,
- Village level mango processing center, and
- Community-based drying center for rice and corn

Sources:
Sebastian, K.L.B., G.M. Tolentino, A.E. Badua and R.P. Estigoy. 2012. *National Postharvest Development Masterplan (Industry Situationer)*, PHilMech, Science City of Muñoz, Nueva Ecija

Philippine Center for Postharvest Development and Mechanization (PHilMech) and the Provincial Government of Bukidnon. Bukidnon Postharvest Development Plan (2007-2017). PHilMech, Science City of Munoz, Nueva Ecija

www.bukidnon.gov.ph



ASSESSMENT OF THE MECHANIZATION LEVEL AND REQUIREMENTS OF CORN FARMS IN THE PHILIPPINES

Hernaiz G. Malanon and Renita SM. Dela Cruz

A INTRODUCTION

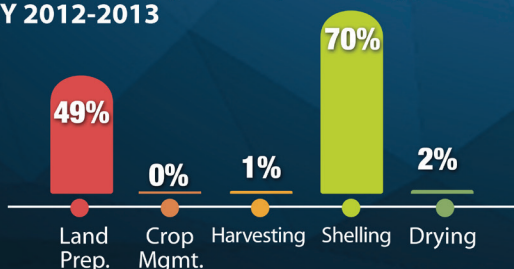
- The status of agricultural mechanization is essential in formulating effective and sustainable mechanization policies and programs.
- The project aimed to generate information and insights on the status of corn mechanization and estimate the mechanization requirements of corn farms in the Philippines.

B METHODOLOGY

- Research Design: One-shot cross sectional survey
Location and Scope: Corn production areas in 13 provinces
- Sampling Procedure: Multi-stage sampling; 1,235 corn farmers
- Analysis Procedure:
 - Descriptive statistics using SPSS
 - Indicators of state and level of agricultural mechanization

C HIGHLIGHTS

- Percent of area/volume mechanized by corn farmers, 13 major corn producing provinces, CY 2012-2013



- Table 1. Percent ownership of draft animals & farm machines of corn farmers, 13 corn producing areas, CY 2012-2013

VARIABLE	VALUE
1. Draft animals	26
2. 4-wheel tractors	6
3. Irrigation pumps	14
4. Corn sheller	5

- Table 2. Mechanization requirement targeting non-mechanized areas, 13 major corn producing areas, CY 2012-2013

MACHINE	UNITS
1. 4-wheel Tractor	7,367
2. Mechanical Planter	1,519
3. Combine Harvester	294
4. Corn Sheller	2,310

- Farm power utilization, hp-hr/ha; CY 2012-2013



D CONCLUSION & RECOMMENDATIONS

- Land preparation and shelling – the two most power-intensive production operations – are fairly and highly mechanized, respectively, supporting previous findings that power-intensive operations are mechanized first.
- Next to land preparation and shelling, harvesting and planting are the next operations requiring relatively high power, implying that technologies facilitating these operations will be needed in the near future.
- (a) Establishment of support structures; (b) support to the acquisition of machines should also consider replacement of old & inefficient machines; (c) smaller machines should also be developed and promoted for smallholder farmers; (d) information/education campaign among farmers on the advantages and availability of machine technologies; (e) more infrastructure support in terms of irrigation and access roads.

COVER STORY

CORN GRITS: NEXT TO RICE, NEXT TO RISE

BY VLADIMIR CALIGUIRAN

Corn is one of the most important crops of the country. In 2014, more than 2.5 of the agricultural lands were planted with corn. The total land area dedicated to both white and yellow corn were almost equally distributed. However, in terms of volume of production the yellow corn recorded a much higher yield than the white variety with 5.5 million metric tons and 2.3 million metric tons, respectively. White corn is abundant in Central Visayas and Mindanao while yellow corn abounds in the regions of Cagayan Valley, Northern Mindanao and SOCCSKSARGEN.

Corn, specifically the white corn grits, is the second staple food of Filipinos, next to rice. According to the Department of Agriculture, about 20 percent of the population is eating white corn while the yellow corn is processed into different feeds and industrial products.

Healthier rice supplement

Residents from the central and southern part of the country consume white corn as their staple food. In fact, the Pambansang Kamao Manny Pacquiao, a native of Mindanao, was chosen to help the government promote the consumption of white corn grits. "This is the food of champion like me. Let's eat corn for a stronger and healthier body," the world boxing champion says in his infomercial.

A healthier option, white corn is rich in proteins and minerals such as magnesium, potassium, niacin, phosphorus, iron, and folate. The staple food is also high in fiber that could help reduce levels of bad cholesterol (LDL) and toxins that may cause colon cancer.

White corn is also promoted for its low glycemic index (GI). Eating foods with low GI can lessen

the risk of diabetes, delay hunger pangs and aid weight loss.

In crafting the Food Staples Sufficiency Program (FSSP), the government identified the diversification of food consumption by intensifying the production of other staples such as white corn as one the strategies and key interventions.

Mechanization complement

In response to the FSSP, the Department of Agriculture's Agri-Pinoy Corn Program (APCP) together with the Bureau of Agricultural Research and the Philippine Center for Postharvest Development and Mechanization identified the development of improved village corn mill to complement the goal of the program.

"Noon kasi ang problema natin ay wala tayong magandang locally manufactured corn mill na makapapasa sa standard (Our problem before was we don't have a locally manufactured corn mill that passed the standards)," Mr. Milo Delos Reyes former APCP coordinator and currently the regional technical director for DA- Regional Field Office 4A.

He added, *"Kapag bumili ka ng corn grits, iba-iba ang size at maraming sediments. Kaya naisip itong [R&D sa] cornmill ay para gawing competitive ang ating corn grits. Kapag competitive na tayo, malaki ang kita ng ating mga magsasaka. . . Dahil ang mga magsasaka natin, dinadala pa sa malayo [ang kanilang mga mais] at hindi pa maganda [ang cornmill], nagiging lugi siya kasi mababa ang milling recovery. 'Yung ating mga corn farmer and consumer, eh hindi na lilipat sa rice dahil may available na tayong*

magandang corn mill. (Available corn grits in the market have mixed sizes and with sediments. That's why we thought of conducting R&D on cornmill to make our corn grits competitive in the market. Competitiveness means higher income for our farmers... Because our farmers need to travel long distance yet they get a low milling recovery of their produce. Our corn farmers and consumers will no longer shift to rice if we have a good corn mill.)"

According to the Agri-Pinoy Corn Program, they want an improved corn mill to address the efficiency and competitiveness of the white corn industry.

To realize this goal, the APCP tasked the PHilMech to conduct the R&D.

The R&D process

Dr. Michael Gragasin and his group at the Agricultural Mechanization Division of PHilMech took the lead in the design and development of the compact corn mill.

Based on the group's analysis on the tests conducted by the Agricultural Machinery Testing and Evaluation Center (AMTEC) of the University of the Philippines at Los Baños, locally manufactured corn mills have failed to meet the minimum standards. The Philippine Agricultural Engineering Standard prescribed a minimum degerminator efficiency of 80 percent and main product recovery of 64 percent.

They added that "low degerminator efficiency provides poor quality of corn

continued on next page...



Dr. Antonio Gerundio



Mr. Milo Delos Reyes



Mr. Virgilio Lanzuela

Corn grits... from page 13

grits while low product recovery indicates high postharvest losses during milling operation.”

Focusing on these two important factors, Dr. Gragasín’s group successfully developed a laboratory-prototype unit of new and improved compact corn mill that satisfied the PAES.

The PHilMech then collaborated with the local manufacturing industry through the Metalworking Industries Association of the Philippines (MIAP). One of the members of MIAP— the Rollmaster Machinery and Industrial Services (RMIS), became a partner of the R&D team in fabricating a commercial-prototype unit.

“Habang ini-improve ni Dr. Mike ang research para mapataas ang capacity, tinutulungan naman namin siya in terms of fabrication. Kaya napadali ang development ng project na ito. Kaya this year nagkaroon na ng commercialization. (While Dr. Mike conducts the R&D to increase the capacity, we assisted him in terms of fabrication. Thus, the project development was faster. And this year, the technology has been commercialized.),” Mr. Virgilio Lanzuela, owner of the RMIS, shared.

“Maganda yung research, kasi mga dalawang trials lang kami, in a short time eh naging successful. ‘Yung output na gustong makuha ni Dr. Mike ay na-surpass pa. (We have a good research, we just

conducted two trials and we are successful in a short period.),” he added.

Mr. Lanzuela also shared that when he was a kid, he grew eating white corn grits. “In terms of quality, ang quality ng grits ay malinis. Dahil noong bata ako, kumakain din ako ng mais at mahirap lunukin dahil maligasgas kasi humahalo yung balat sa bigas. Pero dito sa output ng design ni Dr. Mike, ito ay napakaganda. (The machine produces clean output. when I was still young, our family consumes corn grits and we are eating rough grits because the outer coverinf of the corn were mixed-up with into the grits.),”

“Ang nagustuhan pa ng mga kasama ko eh dahil compact, maliit and yet napakalaki ng capacity. . . Ito ay isang breakthrough, kasi sa kasaysayan ng buhay ko bilang fabricator, ngayon ko lang naranasan na nakikita ko ang ingenuity ng isang Filipino researcher at maipagmamalaki ko kasi ito ‘yung truly Filipino (My colleagues liked the technology because it is compact-- it is small yet it has a large capacity... This is a breakthrough, Over the course of my career as a fabricator, It is only now that I saw the ingenuity of a Filipino researcher and I can be proud because this is the truly Filipino.),” Lanzuela shared happily.

“Masasabi kong ito ay 100 percent Filipino. Kaya nga sa



metal working industry, mayroon tayong masasabing product line—na makapagbibigay ng magandang income sa industry at the same time ma-address natin yung tunay na intention ng project na ito— yung food security. Sabi nga natin, kung magiging successful ito, yung requirement natin sa rice ay mababawasan kasi ma-o-augment ng corn ang supply natin. Kaya masasabi natin na ito ay napaka-novel na project. (I can say that this is a 100 percent Filipino. We have now our own product line in the metal industry which can give us a better and at the same time we achieve the primary purpose of the technology which is food security. We believe that if this will become successful, our requirement on rice will be reduced because it can be augmented by our corn supply. This is really a novel project.),” he further explained.

Right after the commencement of the commercialization of the

compact corn mill, the RMIS received orders and intentions to buy from the different regions of the country. The company is also considering the promotion of the technology in the ASEAN region particularly in Indonesia.

Quality grits

The Agri-Pinoy Corn Program is optimistic that this compact corn mill will have a remarkable impact.

The machine can produce grits with size 6-8, 10-12, 14-18 and corn flour. Tests results showed that the minimum product recovery and degerming efficiency satisfied the PAES with 64.7-99.7 percent and 81.2 to 94.7 percent, respectively.

The newly-developed cornmill has an output capacity of 240 kilogram per hour.


“Malaki ang maitutulong ng makinaryang ito, hindi lamang para sa mga magsasaka kundi

pati sa mga manginginain. (This machine will be a big help not only to the farmers but to the consumers too.),” Dr. Antonio Gerundio, APCP national coordinator explained.

“The efficiency factor [of the cornmill] ay mataas at very competitive. (The efficiency factor of the corn mill is high and competitive.) Providing technology, specifically village type corn mill will provide access to our corn grits consumer. The one being developed by PHilMech ay malaki talaga ang impact nito. (The one being developed by PHilMech will have a great impact.) ” he added.

Dr. Gerundio, who is a white corn consumer himself, believes that the consumption of white corn can help the country to achieve food staple sufficiency and health security. *“Pakiramdam ko mas malakas ako kapag mais ang kinain ko. (Everytime I eat corn grits, I feel I am stronger.)”*





THE STORY BEHIND THE CHICHACORN OF ILOCANDIA

by Mila B. Gonzalez

Chichacorn or cornick. Cornick or chichacorn. Whichever name you prefer, this crispy, crunchy snack is very popular among Filipinos of all ages especially during picnics, movie outings, parties, wakes and drinking sprees with buddies. Chichacorn and cornick also make special pasalubong to friends and relatives.

Chichacorn and cornick are prepared from glutinous white corn. The only difference is their length of cooking. In its simplest method, both snacks undergo similar processes of boiling, washing, drying, frying and packing. Chichacorn however takes a longer boiling process. This accounts for its popped-up appearance similar to the chicharon made from the pig's skin.

What is the story behind the chichacorn of Ilocandia? A lot. It tells about the women

and men processing chichacorn. It tells about their practices, problems and coping strategies. It tells about how their problems can be addressed through recommendations of the team of researchers from the Philippine Center for Postharvest Development and Mechanization (PHilMech) who took notice of their plight and venture.

The chichacorn processors

Aling Juanita is a 50-year old woman in Ilocos

Sur. She is engaged in the processing of chichacorn. She processes a little below 500 kilograms of chichacorn every month. Although she had no formal schooling in chichacorn processing, she has thrived in the business for more than 13 years already.

Mr. Benito, 44 years old, also processes chichacorn. With less than five years in the chichacorn business, he processes 750 kilograms of chichacorn every month.

Mrs. Norma, 49 years old, processes more

than 1, 250 kilograms of chichacorn monthly. She has been in the business for 13 years now. She is also without formal schooling in the chichacorn business.

Aling Juanita, Mr. Benito, and Mrs. Norma are among the Ilocano processors of chichacorn. Each represented the typical small-scale, medium-scale and the large-scale processors of chichacorn in Ilocandia. They formed part of the study, "Documentation of the Postharvest Practices of Rural-based Processors of Chichacorn in Region I" conducted by PHilMech. The study was led by Dr. Renita SM dela Cruz, division chief of the Socio-economics and Policy research Division of PHilMech.

All the three chichacorn processors buy the white glutinous variety of corn from the farmers because this is the most suitable variety for chichacorn production. Aling Juanita buys the smallest amount of glutinous white corn of about 26 bags each month. Mr. Benito buys twice the amount, 57 bags per month. Meanwhile, Mrs. Norma is the largest buyer of glutinous corn, 187 bags per month.

Farmers deliver class A glutinous corn to Aling Juanita, Mr. Benito and Mrs. Norma who only buy dried corn. However, these processors do not use any moisture meter to determine how dry their bought corn is.

To have a ready source of white corn even during off-season, processors store unprocessed corn grains. Aling Juanita and Mr. Benito store their white corn grains at their own houses. Mrs. Norma store her corn grains at her warehouse.

The chichacorn processing

So how is chichacorn made?

The raw glutinous corn is boiled with lime to hasten removal of the outer grain cover. The corn is then washed to remove lime, grain



cover and cap. The corn grains are again boiled to attain desired softness and texture. Washing and draining follow. The semi-processed chichacorn is then sundried for two and a half days without interruption to prevent spoilage. Then the chichacorn is deep-fried and seasoned with ingredients and flavoring like cheese, garlic, chili and barbecue. The chichacorn are packed in labeled plastic and sold in retail stores, supermarkets and pasalubong centers.

Problems and proposed solutions in chichacorn processing

Drying of semi-processed chichacorn during rainy season. Insufficient raw materials. Lack of capital. Storage. Marketing. These are the main problems encountered by Aling Juanita, Mr. Benito and Mrs. Norma in their agribusiness venture.

To address their problems, the PHilMech team of researchers--Dr. Renita SM dela Cruz, Engr. Shiela Marie A. Villota and Dr. Ma. Cecilia R. Antolin --recommended the need for an appropriate mechanical dryer in drying both raw and semi-processed corn kernels.

They also recommended that the Department of Agriculture-RFU 1 should prioritize the development and commercialization of appropriate types of corn for processing. The team suggested that DA link the farmer-growers of glutinous corn to the chichacorn processors.

"PHilMech, on its part, should develop training module and conduct training courses for corn processors particularly the proper handling of raw materials to prevent losses," said Dr. dela Cruz and her group. They suggested topics like the identification and control of insect pest in storage, technologies available to prevent losses in storage, precautions towards food safety including the prevention of aflatoxin, a cancer-causing substance brought about by the fungi, *Aspergillus flavus* and *A. parasiticus*.

Further research and development activities have been proposed as well by the project team. These researches can be undertaken not only by PHilMech but also by the state colleges and universities. Researchable topics suggested by the team include supply chain study of chichacorn; study on the drying characteristics of semi-processed chichacorn; study on the aflatoxin contamination of stored semi-processed chichacorn; and packaging and storage studies of corn grains to reduce quantity and quality losses due to insect pests, among others.

Yes, there is a lot to tell about your favorite snack and pasalubong—chichacorn. More than its unforgettable taste and crunchiness, chichacorn bears the labor of love of the processors and the promise of this profitable agri-venture.

Reference:

Dela Cruz, R. SM., S.M. Villota and Ma. C. R. Antolin. 2014. Documentation of the Postharvest Practices of Rural-based Processors of Chichacorn in Region I. Postharvest and Mechanization Journal. Science City of Muñoz, Nueva Ecija: PHilMech.



Improving Corn Quality and Quantity through CPTC

by Vladimir B. Caliguiran

From food to fuel,
kitchen to poultry;
hundreds of corn
products and by-products
are essential to man's daily
activities. Corn farming also
serves as the main source of
livelihood of many Filipinos.

In the recent years, the Philippines is just a step away to self-sufficiency level. Production and postharvest issues such as high cost of farm inputs, severe and unpredictable weather conditions, pest infestation, and high postharvest losses hinder the growth of the industry.

Saving the harvest from postharvest losses could help the country in producing its own corn supply.

A study of the Socio-economics and Policy Research Division (SEPRD) of PHilMech in 2006 revealed that around 7.18 percent accounts to quantitative and qualitative losses. The study was conducted in the three major corn producing provinces—Isabela, Bukidnon, and South Cotabato. Moreover, the study recorded that drying contributes the largest losses with 63.23 percent share or an average of 4.54 percent.

The government has been investing on interventions to curb the postharvest losses. The Department of Agriculture through the Agri-Pinoy Corn Program is providing postharvest development services by provision of facilities, equipment and technologies to the industry. Most notably is the establishment of corn processing and trading centers (CPTC) in the different parts of the country where wet conditions generally prevail during harvesting season.

The CPTC is a facility composed of postharvest technologies such as corn on cob and grain dryers with biomass furnace, sheller, and storage bins. This set of technologies aims to reduce the quantitative and qualitative losses due to aflatoxin contamination and incidence of broken and moldy grains.

The CPTC employs two-stage processing and marketing system. This system was adopted from the practice of Mindanao Grains Processing Corporation, one of the country's largest corn traders. The CPTCs were designed to procure newly harvested corn-on-cobs (CoC) from the farmers. The COCs will then be dried to reduce moisture content to 18

to 20 percent for shelling. After the shelling operation, the grains will undergo another drying operation to achieve the 14 percent recommended moisture content safe for storage.

The CPTC has two types, the large scale with a 200 metric ton CoC dryer and the village-level type with 10 to 20 metric ton capacity CoC dryer.

In a recent assessment conducted by the team of Hernaiz Malanon and Dr. Renita dela Cruz of PHilMech-SEPRD, they noted the effectiveness of the CPTCs in reducing the high postharvest losses. The facilities lower postharvest losses at 5.3 and 6.2 percent during the first and second cropping season, respectively.

The researchers also found out that the CPTCs reduced the aflatoxin contamination by 25 percent during the dry season and 33 percent during the wet season. The same trend was also observed for the incidence of broken and moldy grains.

Selected large-scale and village-level CPTCs in Pangasinan, Agusan del Sur, Isabela and South Cotabato were evaluated for their technical and socioeconomic performances.

The study revealed that 'farmers who sold their produce to CPTCs obtained additional profit ranging from P 1,152 to P 4,591 per hectare.'

CPTC produces premium quality corn grains. The operation and management of CPTC can be undertaken by single individual or well-organized and progressive farmers' groups that are already involved in trading.

From the operators' point of view, the benefits of operating large-scale CPTC can be attained if corn can be sold at a price higher by at least P0.80 per kilogram. Operators of village-level CPTC should partner with large-scale CPTC operators to get the benefit of higher price offered by institutional buyers of premium grade corn.

With these developments, the industry is optimistic that the country will have an increased quantity and a better quality of corn.

Reference:

Malanon, Hernaiz G., R.S.M. Dela Cruz, S.B. Bobier and M.C.D. Regis. 2012. Technical and Socio-economic Evaluation of the Two-Stage Corn Processing and Trading Centers in Selected Corn Producing Provinces. Unpublished Terminal Report. Philippine Center for Postharvest Development and Mechanization. Science City of Muñoz, Nueva Ecija.



Village-level Corn Processing and Trading Center



Retrofitted compact rice mill for production of both well-milled and brown rice

PHilMech, MIRDC launch innovation on brown rice production

The PHilMech and the Metals Industry Research and Development Center of the Department of Science and Technology (MIRDC-DOST) launched the retrofitted compact rice mill for brown rice production on August 20, 2015 at the PHilMech, Science City of Muñoz, Nueva Ecija.

Project leader Engr. Nico Deus O. Villafranca of MIRDC-DOST explained that the innovation will enable ordinary rice mills to produce quality brown rice as well as well-milled rice. Based on PHilMech study in 2010, this rice mill is the most commonly used (96 percent) in the country.,

He said that by adding bypass

tray or diverting chute, the machine can produce both brown and polished rice.

DOST Assistant Secretary Robert Dizon said that brown rice production would also augment the rice supply in the country because of the higher milling recovery compared to well-milled rice.

PHilMech Director Rex L. Bingabing also stressed that “with the development of this modified rice mill, we hope to encourage consumption of brown rice by increasing its supply and availability.”

Based on field testing using RC216 rice variety, the machine

has an input capacity of 495 kilogram per hour and a hulling recovery of 69 percent.

The project was funded by the Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development of the DOST (DOST-PCAARRD) and implemented by the MIRDC-DOST.

The PHilMech is one of its R&D partners together with the Project Management and Engineering Design Services Office of DOST. Meanwhile, Mariñas Technologies Inc. and Sumang Rice Thresher and Welding Shop are its industry partners. ***VBCaliguiran***



PHilMech Deputy Director Raul R. Paz led the SOA graduation at Benguet State University.

2 SOAs produce 747 graduates

Two school-on-the-air (SOA) programs on postharvest handling successfully produced 747 graduates in Benguet and Misamis Oriental.

The PHilMech in collaboration with the Benguet State University (BSU) finished the “School-on-the-Air on Postharvest Handling of Selected Semi-Temperate Vegetables and other High Value Crops” on July 1, 2015. A total of 224 farmers completed the SOA and were recognized during the culminating activity.

“Kami po ay mahahalintulad sa isang iskolar dahil hindi kami gumagastos sa pamasaha at sa tuition fees kundi kami ay nakikinig lamang sa radio tuwing umaga (We could be compared to a scholar because we are not spending on fares and tuition fees, but we are only listening to the radio every morning),” said SOA topnotcher Ms. Alma Mae Capuyan .

Dr. Ben D. Ladilad, BSU president, expressed his gratitude to PHilMech and to the farmers actively participated on the SOA program. He assured that the BSU will continue to serve their stakeholders especially the farmers in Benguet province.

The SOA module covers latest technologies developed by PHilMech and postharvest practices of various semi-temperate vegetables like lettuce, broccoli and other high value crops such as potato, cassava, coffee etc. The SOA provides timely and appropriate information especially the small scale producers of said commodities in the province.

Meanwhile, the SOA program on “Postharvest Handling of Horticultural Crops” at Misamis Oriental State College of Agriculture and Technology (MOSCAT) held also the graduation ceremony last

September 24, 2015. A total of 250 individuals received certificates of completion during the said program.

The SOA aimed to disseminate the information on postharvest handling on horticultural crops especially for the vegetable producing farmers in Claveria, Misamis Oriental.

Dr. Rosalito A. Quirino, president of MOSCAT professed his admiration to the farmers who have shown working attitude in serving the nation by tilling the land to produce food for the people.

The two SOA programs are part of the PHilMech project, “Enhancing the Agricultural Extension Delivery System on Postharvest and Mechanization through the SCUs and the Techno Gabay Program.” **RDDeGuzman**

MAKINA SAKA 2015



Lucena - November 17-19, 2015
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CAR coffee... ***from page 6***

inputs. (Lastly,) it poses a good opportunity for meeting the demand of the market for organic products.”

Dr. Bantog also emphasized, “(The turn-over) is not the end but it is the beginning of challenges. *Karkaro kanyayo nga*” (More so to you), organizations. Why challenges? Because you are already given the responsibility to ensure that these equipment will be

operational and would produce profit and employment. It is a start where all members of your organization should work hand in hand harmoniously. *Daytoy kit haan nga mangdivide* (This should not divide you) but it will bind you together to achieve the objectives we have set. “

In accepting the technologies and in response of the recipients to the challenge, Bauko, Mt. Province Mayor Abraham B. Akilit said, “*Kung walang tulongan, walang progreso* (If we don’t help each other, there

is no progress).” He further reiterated that coffee as a product is not only a sustainable crop, but promises good investment returns. He sees the coffee plantations in the mountains as good attraction for tourism and as good protection to their forests and watershed.

For other recipients, they gave their commitment to make the technologies they have received operational and profitable. Accordingly they said, “Since much is given, much is expected.” **BGSMagararu**

RiCE MiX

Ano ang rice mix? Ang rice mix ay kanin na hinaluan ng iba pang pagkain tulad ng mais, kamote, cassava, o adlai upang gawing mas masustansya ang kanin.

Maging **RICE**ponsible! Kumain ng bigas na hinaluan ng mais, kamote, cassava at adlai!



Compact Corn Mill

This technology produces good quality corn grits with higher milling recovery. This can be used in the production of corn grits and cracked corn for food and feeds.

Photo by Danilo T. Esteves



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