

FARMERS

Planting the Seeds of Empowerment

About 13.3 million farmers in 25 countries have planted biotech crops spread across 125 million hectares. Of these farmers, over 90 percent or 12.3 million are small and resource-poor farmers from developing countries such as China, India, Philippines, and South Africa. The high adoption rate reflects the fact that biotech crops have consistently performed well and delivered significant economic, environmental, health and social benefits to both small and large farmers. The International Service for the Acquisition of Agri-biotech Applications (ISAAA) projects that the number of biotech crop countries, hectareage and beneficiary farmers would significantly increase by 2015 particularly with the impending approval of biotech rice (James, 2008).

Providing an environment where farmers can share information and experiences with other farmers about biotechnology is an activity of the International Service for the Acquisition of Agri-biotech Applications (ISAAA) through its Global Knowledge Center on Crop Biotechnology and its network of Biotechnology Information Centers. The network sees the positive acceptance and/or adoption of a technology by farmers as a vindication of its contributory efforts at increasing awareness of and understanding of biotechnology. In countries where biotech crops are already being commercialized, efforts are geared toward sustaining interest and use. In countries where they are not yet being grown, farmers are being oriented and updated on biotechnology developments with the hope that they would be positive to the idea of modern technology once commercialized in their own country.

ROSALIE ELLASUS

Lady Corn Farmer Goes International

By Mariechel J. Navarro and Sonny Tababa



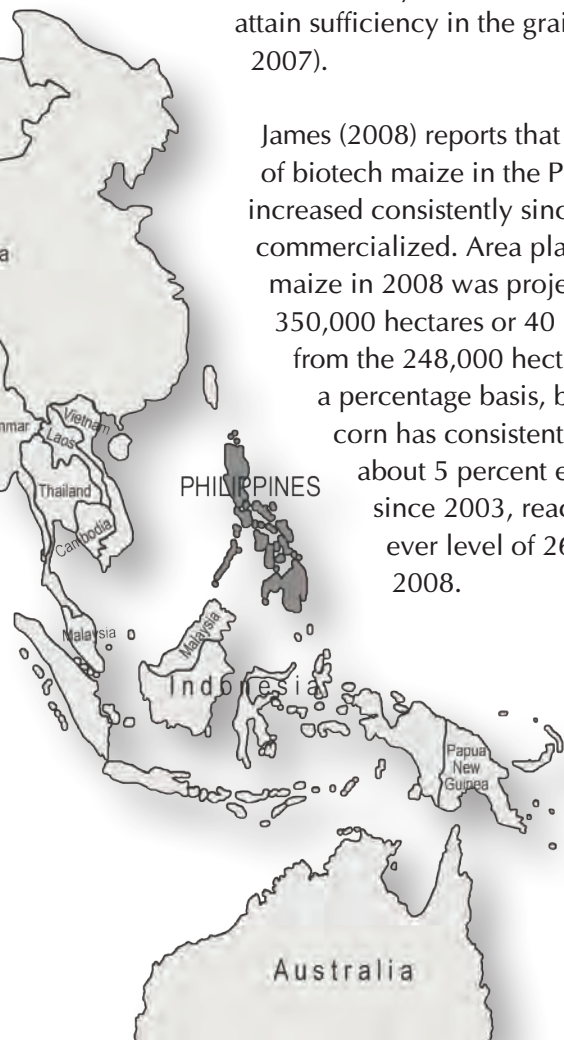
The Philippines is the first country in Asia to have a biotechnology crop for food and feed approved for commercialization. It was able to initiate commercial planting of Bt corn in 2003. This is a significant development since next to rice, corn is the second most important crop in the country, with yellow corn accounting for about 70 percent of livestock mixed feeds. The Asian corn borer has done extensive damage and Bt corn is expected to provide another option for farmers to obtain better yields and help the country attain sufficiency in the grain (Navarro et al. 2007).

James (2008) reports that the adoption of biotech maize in the Philippines has increased consistently since it was first commercialized. Area planted to biotech maize in 2008 was projected to reach 350,000 hectares or 40 percent higher from the 248,000 hectares in 2007. On a percentage basis, biotech yellow corn has consistently increased by about 5 percent every single year since 2003, reaching the highest ever level of 26.8 percent in 2008.

Enjoying the benefits of biotech corn and a leading advocate of agricultural

biotechnology is Rosalie Ellasus, a 49-year old lady farmer from San Jacinto, Pangasinan. From tilling only 1.3 hectares of agricultural land in 2002 which she acquired from her savings from being an overseas Filipino worker, she now has a six hectare farm. From just being an “outsider” hiring farm helps to till her small farm land, she is now a hands-on farmer active in helping other farmers use modern agricultural production practices through the San Jacinto Kasakalikahan Multipurpose Cooperative. Not only did she become president of PhilMaize in 2006 but also won as town councilor in the 2007 local elections (Paredes, 2007).

To add a feather in her cap, she was internationally recognized as the first recipient of the Kleckner Trade & Technology Advancement Award in 2007, named for Truth & Technology (TATT) Chairman Dean Kleckner, a past President and a well-known international farm leader. Chosen by Board members, the award is given for “exemplary leadership, vision and resolve in advancing the rights of all farmers to choose the technology and tools that will improve the quality, quantity and availability of agricultural products around the world.” John Reifsteck, an Illinois farmer who serves on the TATT Board, says Rosalie was selected because “she represents what TATT represents. It’s a disservice to farmers like Rosalie to say that biotechnology and trade issues are only about large farmers; those issues affect all farmers.” Rosalie was commended for using biotechnology to solve her production challenges on the 1.3 hectare farm she owned. “Biotechnology can be used by any size or type of farmer in the world. It’s a very portable



technology. And Rosalie is a great role model to demonstrate this," adds Reifsteck. She received the award during a farmer-to-farmer roundtable sponsored by TATT in Des Moines, Iowa, USA (Truth About Trade & Technology, 2008).

From Obscurity to Prominence

Like many Filipinos, Rosalie started with trying to fulfill a major dream – to help her family lead a decent life and be able to send her three sons to college. "I decided to go abroad and become a domestic helper in Singapore and Canada. I eventually found a market executive position in Singapore. Unfortunately, my husband died and I decided to return to the Philippines to take care of my sons," she says. From her savings she bought a small farm land and tried unsuccessfully to coax a bountiful harvest from it. Corn with aflatoxin contamination as well as pests and weeds that reduced her yield made it impossible to sell her produce. Unfazed, Rosalie attended a 16-week Integrated Post Management-Farmers' Field School on corn in 2001 by the Department of Agriculture. From her learnings, she changed her farm practices and after seeing a demonstration Bt corn farm, she decided to adapt the technology to compare it with conventional corn. Rosalie was able to sell her Bt corn produce to feedmills and corn husks for local craft production because they were flawless and sturdy. The venture proved profitable – she was able to expand her 1.3-hectare farm to six hectares (Fernandez, 2007).

The TATT website says that Rosalie has been getting a 125 percent return each year. She has adopted corn "stacked" with both a Bt gene and a herbicide resistant gene. "I was truly convinced that a marginal farmer can improve his lifestyle only if he will adopt biotechnology," she says. As a consequence, it has been easy for Rosalie to convince other farmers in her town as well as other colleagues to go the biotech corn route, especially

when farmers see that she is able to have an average yield of 7.8 tons, up from 3.2 tons when she first started to plant corn.

Attendance in Workshop

In September 2006, Rosalie attended a workshop on biotech issues and communication followed by a similar one three months later. She was one of 34 participants of a four-day workshop on *Farmer Biotech Outreach: Strengthening the Competitiveness of Small Farmers* held in Manila, Philippines. The workshop was implemented by the International Service for the Acquisition of Agri-biotech Applications (ISAAA), the SEAMEO Regional Center for Graduate Study and Research in Agriculture (SEARCA), and the Asian Farmers Regional Network (ASFARNET), with support from the US Government, under the auspices of the Asia-Pacific Economic Cooperation (APEC). As a follow-up of the December 2003 APEC Farmer Biotechnology Outreach Program held in Manila, this workshop aimed to: increase Southeast Asian farmers' awareness of the challenges facing agricultural biotechnology as well as its benefits; enhance farmers' knowledge of policy issues;



Rosalie with other workshop participants during a Bt corn field tour in the Philippines.

“Updates about biotechnology are important because I am often asked about issues and concerns by colleagues.”

provide first hand experience through visits to local farms, and research and development institutes; explore effective communication techniques for farmers; facilitate sharing of experiences in using modern biotechnology; and discuss and recommend more sustained activities among farmers. Participants came from China, India, Indonesia, Malaysia, Philippines, Thailand, USA, and Vietnam.

The workshop involved discussion of issues, sharing of farmers’ experiences, field tours, and planning for the next set of activities. Topics included an overview of agricultural biotechnology, and the global status of developments in crop biotechnology adoption and applications, market access of agri-biotech products, and market acceptance/concerns. Farmers from China, India, Philippines and the US shared experiences on planting biotech crops like cotton, corn, and papaya. Farmers from Southeast Asia discussed country case studies with regard to farmers’ networks such as ASFARNET and related groups. Communication theory and skills were shared with participants to enable them to be effective disseminators of information to varied audiences. Farmers discussed strategies and plans to foster communication and information exchange among farmers in their respective countries. Capping the various activities was a tour of farmers fields planted to biotech corn in Mexico, Pampanga; and research and development agencies like the University of the Philippines Los Baños Institute of Plant Breeding, and the International Rice Research Institute.



Rosalie discusses biotech communication issues in a Manila workshop.

Participants declared that accurate information on modern agriculture in general, and crop biotechnology in particular, are needed by farmers to constantly update them about agricultural options, and to enable them to make informed choices. During the brainstorming session, farmers voiced out the need to continue the goals of ASFARNET, and suggested strategies by which farmer groups could either set-up a similar entity or imbed objectives of activities currently being done by existing systems in their respective countries. Sustainable, workable plans were formulated by farmer groups to enable the realization of these objectives. A central theme of the farmers’ presentations was the importance of access to adequate information for farmers regarding agricultural practices. The workshop was perceived to be “trail blazing and very informative” and that there should be more of these workshops as “learning is a continuous process” (Report: Farmer Biotech Outreach: Strengthening the Competitiveness of Small Farmers, 2006).

Rosalie speaks highly of this workshop. “Updates about biotechnology are important,” she says, “because I am often asked about issues and

concerns by colleagues. I am able to inform other farmers about research developments such as biotech papaya and Bt eggplant as well as developments outside the country which might impact on local conditions.” She found the interaction with other international farmers very enriching. It was her first time to share experiences with other farmers who like her were excited about the prospects of using modern technology. It also was a dry run for her future attendance in international fora where she would represent small farmers.

“The principles and techniques for effective biotechnology communication session that I got from attending other SEARCA Biotechnology Information Center (SEARCA BIC) workshops proved useful in enhancing my interpersonal skills. Whenever I am confronted by people who are against biotechnology I remember the role playing in the communication session where we had to answer questions from different stakeholders. I am able to answer in a nice way by being diplomatic and without getting antagonized by those who are anti-biotech. I am also conscious about the principles of body language, the need for voice modulation, and continuity in explaining my messages even when interrupted by other people. I observe other resource persons and adapt techniques that are useful.” Rosalie avers that her confidence comes from “talking from the heart, actually doing the things I talk about, and being inspired by and being able to relate with other farmers.”

Rosalie Goes International

It was ISAAA which recommended Rosalie to other international workshops in Indonesia and Australia where she spoke on her experiences as a small farmer from a developing country. Farmers that she meets in these international gatherings email her and ask her opinion about issues that are written in media. For example, she



Rosalie with other farmer participants during a seminar on agricultural biotechnology in Tiera Medan, Indonesia.

cites the case of a negative view espoused by a journalist and a civil society group in Indonesia that a farmer had emailed her about. “I asked the assistance of the BIC in the Philippines and the Biotechnology Coalition of the Philippines, added my thoughts, and consolidated the information for my Indonesian colleague. Other farmers voiced their problems and I encouraged them to set up a farmers’ organization or get political support that would enable them to gain access to new technology.” She says that when she was in Mexico a Senator listened to the discussion and showed interest in helping farmers. “I never imagined I would also be consulted by farmers overseas. I continue to get updates from participants about developments in their countries and we discuss opportunities through email.”

She received other invitations later, including the Des Moines roundtable discussion on agricultural biotechnology, the Minneapolis conference of the Western Canada Wheat Association, one in Mexico sponsored by its Department of Agriculture, and another farmers’ forum in Medan, Indonesia. When Peruvian and Vietnamese government officers and scientists visited the Philippines, she was tapped to talk to them. In all these venues, she gave a straight from the heart account of her biotech farming experiences.

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In February 2008, Rosalie was the featured lady farmer during the international launch of the 2007 Global Status of Commercialized Biotech/GM Crops report by Dr. Clive James, chair of ISAAA and report author. She was a member of a panel of experts that gave a "face" to the growing number of farmers benefiting from biotechnology.

The lady farmer is constantly invited to grace farmers' festivals organized by the provinces of Pangasinan, Cavite, Isabela, and Cotabato City to help spread the "good news" around and convince more farmers to adopt the technology. These festivals, she adds, attracts even old farmers who are hesitant to try new technology. She is a much sought out resource speaker by the Department of Agriculture and gets engaged in policy and planning with non-government organizations. In addition, she has been interviewed in both television and radio programs where she talks about farming and the opportunities it has brought her. She is amazed by those who have heard about her and was particularly thrilled when she was asked to "Google" her name on the Internet. "So much has been written about me. It really inspires me."

Rosalie notes that recently there was a problem regarding the availability of biotech corn seeds in the market and even Congressmen had to intervene for their constituents. "It was a demand problem.

Private companies make seasonal forecasts about how much seeds are needed. They did not anticipate the huge demand for the seeds. They did not think that many farmers would embrace the technology," Rosalie explains. Hence, she is now into seed production to assure steady supply for farmers. It is a challenge, she states, as the seed companies demand 98 percent seed purity. However, farmers are assured of a high quality product. "It's hard work but fun." Her eldest son, one of three she sent to college on her biotech crop harvest, is now coordinator of seed production.

Beyond Bt Corn

The lady farmer has expanded her interests to include domestic animal production as the corn she harvests is mixed with her own feed formulation. She now has 30 fattening pigs and 6 sows in her backyard as well as a few cows and goats. To cope with the work, she has 'adopted' some out-of-school youth between the ages of 18 and 21 to help her with what she called her 'integrated farm'. She provides housing and allowance for these young men. She spearheaded the training of farmers who observed her production techniques for possible adoption in their own farms. She continues to attend workshops sponsored by public sector groups such as the Mariano Marcos State University and the Philippine Rice Research Institute. These venues are a fora to network and meet other experts and co-farmers.

"Here in the Philippines, many farmers lower their heads because they're not proud of their job. But I want to see them shine. I'm just a small candle", she says, "but even the weakest flame can spread fire" (Biotech Brasil, 2007). Life has just begun for Rosalie. □



RAOSAHIB DEVRAO INGOLE

Leading Farmers by Example

By Bhagirath Choudhary and Kadambini Gaur

Raosahib Devrao Ingole is a cotton and vegetable farmer and owns 10 acres (4 hectares) of land. He is the *Sarpanch* (political head) of Dharkalyan village in Jalna district of Maharashtra State, western part of India. The village has 1,500 people and farming is an ancestral occupation and also a source of livelihood for majority of the rural population. He continued the family tradition of farming on inherited land to feed his five children. He went to school until seventh standard (grade) and understands the importance of education. He wants his children to study and at the same time help him in various farming activities. The income he gets from his Bt cotton harvest enables him to send his children to school. Apart from cotton, the farmer grows brinjal, cabbage and grapes.

Overcoming Apprehensions

Raosahib learned about Bt technology for the first time from Maharashtra Hybrid Seeds Company (Mahyco). He was informed about the benefits generated by the use of biotech crops such as Bt cotton. "Initially I was very reluctant to plant Bt cotton as I had apprehensions that planting Bt crops could be harmful to my health and that of my children and cattle, and also unsafe to the environment. After continued assurance from the seed companies, I was convinced and planted Bt cotton for the first time in 2003-04. I noted the benefits of planting Bt cotton and continued every year thereafter," Raosahib recalls. Being ill-informed, he was denied the benefits generated

from planting Bt cotton for one year. Adopting Bt cotton proved to be a wise move. This changed his perception regarding the safety of Bt crops and he was convinced that Bt technology is safe and better than the conventional alternative. Other farmers in his village also reaped similar benefits after planting Bt cotton. Before, the cotton crop faced severe damage from bollworms. In the recent past however, Bt cotton has changed the face of cotton production in his village. Bt cotton offers attractive incentives to both large and small farmers because of significant yield gains and enhanced productivity in a sustainable manner.

Participation in Brinjal (Eggplant) Video

In October 2008, the International Service for the Acquisition of Agri-biotech Applications (ISAAA) organized field visits to various states to capture first hand experiences of farming communities in India. Experiences of farmers were documented in the Bt brinjal video so that their learnings can be shared with different stakeholders. During the field visit to Maharashtra, as head of the village Dharkalyan, Raosahib was involved in the video production as he was a strong advocate of Bt technology. He was very keen to share his experiences in cultivating Bt cotton. The Bt brinjal video shoot was a good experience as he wanted to be part of the awareness program to promote the use of Bt technology so that more farmers could reap the benefits of Bt crops instead of being misguided by false apprehensions. He is hopeful that Bt brinjal will emulate the success of Bt cotton and help vegetable farmers

save brinjal crops from being destroyed by the deadly insect pest, fruit and shoot borer (FSB). “Bt cotton has proved to be a boon for cotton farmers. If the same technology is replicated in vegetable crops such as brinjal, it will be extremely beneficial for poor farmers”, he says.

Press Conference on Biotech Crops

In February 2009, Raosahib was invited to attend the press conference in New Delhi for the launch of ISAAA Brief 39 by Dr. Clive James on the global status of commercialized biotech/GM crops in 2008. During the interaction with media personnel, he spoke about his experience in planting Bt cotton. He voiced the great success of Bt cotton and talked about the support of farmers for the technology. He also discussed the challenges cotton farmers faced prior to the introduction of Bt cotton. Lok Sabha TV of the Indian Parliament, interviewed him in its most viewed program *Surkhiyon Se Parey* (Beyond Headlines). In the interview he shared his Bt cotton farming experiences that led to improved yield and productivity, increased farm income, and reduced exposure to insecticides.

Spirit of Sharing and Caring: Moral Responsibility

Being the leader of the village of over 1,500 people, Raosahib felt the need to enhance trust in Bt technology to improve agricultural production. Along with other farmers who were already benefiting from Bt cotton, he encouraged farmers growing conventional non-Bt cotton to plant Bt cotton. The awareness about the success of Bt cotton seeds soon spread throughout the farming community. Since 2003, he has been actively promoting the use of Bt technology and is now the model for inspiring other farmers. “After experiencing the benefits of Bt cotton, not a single farmer of my village is planting non-Bt cotton. It is easier for them to sell cotton at a competitive rate. The Bt technology can help farmers to be more competitive in the market. There is no need now to tell farmers what to plant; everyone is buying Bt



Raosahib Devrao Ingole, Farmer and Sarpanch (political head) of Dharkalyan, Maharashtra (left) with a fellow farmer in his brinjal field.

cotton seeds. A farmer no longer asks whether Bt cotton seeds are safe and will give more yield.” The farmers of his village learned by experience. “Farm income increased, yields went up and insecticide sprays were drastically reduced. What more can farmers ask from using Bt cotton?” he asks.

Raosahib thinks that it is vital to increase acceptance of biotech crops and clarify various issues and concerns pertaining the use of Bt technology. “Majority of farmers are illiterate and poor. We do not know science. Although we are convinced about the safety of the technology, organizations such as ISAAA can take the lead in organizing public awareness workshops. Dissemination of science-based information will help farmers make well-informed decisions,” he adds. Raosahib firmly believes that commercialization of other biotech crops such as Bt brinjal will bring prosperity to his village.

Challenges in Agricultural Production

“Farming is an input intensive activity. Apart from laborious farming activities, it requires lot of inputs such as water, fertilizers, and pesticides.

The major constraints being faced in farming are insect pest infestation and diseases which lead to substantial yield losses. Water for timely irrigation is another problem. I feel it is advantageous to accept new technology in agriculture as traditional methods have met with limited success in solving many problems. New technology is needed to sustain agriculture,” Raosahib explains. Bollworm infestation and frequent insecticide sprays were major constraints during many years of cotton cultivation. Conventional non-Bt cotton required a large numbers of insecticide sprays. This was significantly reduced with the introduction of Bt cotton which increased yields significantly. A farmer was able to harvest 8-10 quintal (800-1,000 kg) per acre and sell cotton at Rs 2,800 (US\$62) per quintal. “I had to spray 14-16 times depending on

infestation levels for non-Bt cotton as compared to 3-4 sprays on Bt cotton for controlling minor insect pests. Insecticide sprays were not required for bollworms. It is like a blessing. We are happy as we utilize the increased farm income in other activities such as drip irrigation.”

Crop Biotech: Bright Future

“The future of crop biotech is indeed very bright. Farmers will readily adopt other biotech crops after gaining considerable experience in planting Bt cotton. In fact, we are eagerly waiting for the commercialization of other Bt crops such as Bt brinjal,” says the Indian farmer. Bt cotton planted on 5 acres of land is enough proof that Raosahib is truly convinced with the technology. □

EL-HADJI KARIM OUÉDRAOGO

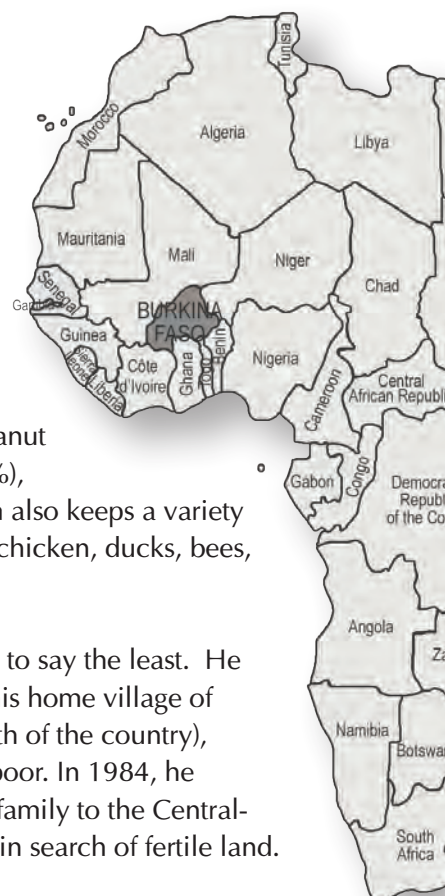
Champion Bt Cotton Farmer in Burkina Faso

By Margaret Karembu and Daniel Otunge

In the Sapouy town of Ziro Province, 100 kilometers from Burkina Faso’s capital city Ouagadougou, a cotton field extends as far as the eye can see. Its owner is El-hadji Karim Ouédraogo, President of the Provincial Union of Cotton Producers. This field is one of the key Bt cotton seed producers in the country. With a countrywide membership of 325,000 farmers in the Cotton Union and the majority being small farmers (less than 10 hectares), Karim’s farm of approximately 20.35 hectares could best be described as a “model farm”. Cotton occupies 34% or 7 hectares (ha) of his land, in which 4.5 ha is planted to conventional cotton and the rest of 2.5 ha to Bt cotton. The diversity of farm enterprises

is striking. Apart from growing other food crops like maize, 6 ha (29.5%), sorghum, 4 ha (19.7%), peanut and cowpea, 2.5 ha (12.3%), sesame, 1 ha (4.9%), Karim also keeps a variety of livestock – cows, goats, chicken, ducks, bees, name it!

Karim’s story is fascinating, to say the least. He started to farm in 1978 in his home village of Sanmentenga (Central-North of the country), where the soils were very poor. In 1984, he migrated together with his family to the Central-South part of Burkina Faso in search of fertile land.

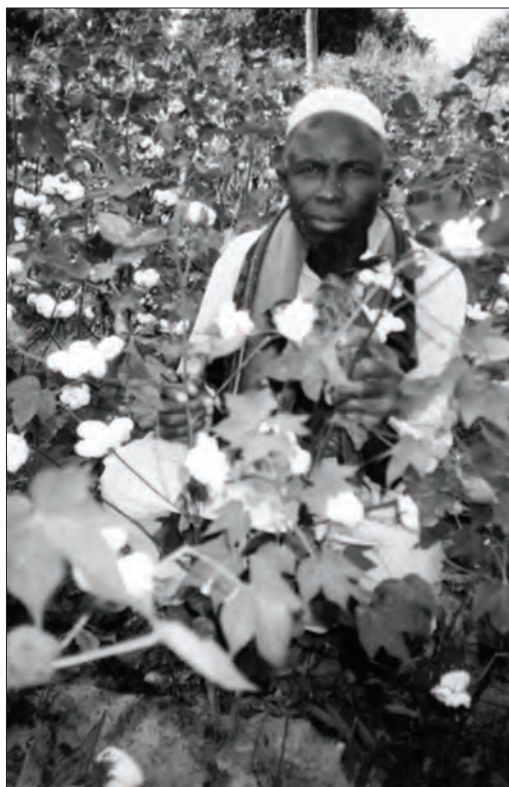


He settled in Sapouy area where he acquired the land he currently farms and quickly put it under cotton and cereals production.

Ladji, as Karim is affectionately known in Sapouy village, has three wives and 17 children. Five have finished secondary (high school) education while the rest are enrolled in Madrasas, also locally known as the Koranic Schools, in Ziro town. Despite having attended rural schools, Ladji speaks very fluent French in addition to his native language of Moore.

Revealing his passion for agriculture, the president of cotton farmers of Ziro declares: "We must do our best here in Ziro and in Burkina Faso in general, so that we can produce enough food for everyone." On average, Ladji produces seven tons of cotton and four tons of assorted cereals (maize, sorghum, cowpeas, peanuts, sesame) annually. In the same period, he also produces six tons of cotton seeds. The produce from his 20-hectare farm earns him over one million FCFA, (approximately USD 2,000) a figure he says is enough to feed, clothe and educate his family. But he is quick to add that the farm could give him more if he had access to better seeds.

And he couldn't be more precise. Since he was chosen to become one of the pioneer farmers to plant Bt cotton for seed multiplication by the *Institut National de l'Environnement et de la Recherche Agronomique* (National Institute of Environment and Agronomic Research) or INERA, the Sapouy farmer has received better results: vigorous plant



Karim in his Bt cotton farm.

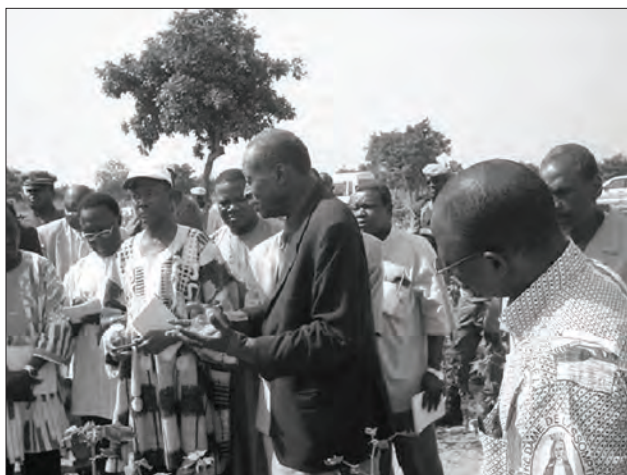
growth, over 50% reduction in pesticide applications and more time to attend to other equally pressing duties. And, with a broad assuring smile, Ladji affirms "I expect a bumper harvest, the first time in so many years."

Pioneer Bt Cotton Farmer

Ladji owes his being chosen to be among the first farmers to grow Bt cotton to a series of workshops and exposure study tours (seeing-is-believing visits) organized by the International Service for the Acquisition of Agri-biotech Applications (ISAAA) *AfriCenter* in collaboration with INERA and the Burkina Biotech Association (BBA) that he participated in between 2006 and 2008. For instance,

in early 2008 he was among the few farmer group leaders who toured Bt cotton field trials in Mouhoun in the western region of Burkina Faso, which is 337 kilometers from his farm. The trials were being conducted by the national research institute INERA and SOFITEX, one of the seed companies operating in the country. "This tour opened my eyes to the high potential of Bt cotton because I saw clearly the difference between the new variety and the traditional one. Since then, I resolved to be among the first farmers to try the new technology," he recalls.

The two-day seeing-is-believing travelling workshop aimed at providing an opportunity for farmers to interact with scientists undertaking the research on Bt cotton and also get first-hand science-based information about the benefits and potential risks of genetically modified crops from other experts. Travelling workshops have been found to be very



Prof. Alassane Sere, President, Burkina Biotech Association (center), briefs farmers and parliamentarians about Bt cotton.

useful in demystifying modern biotechnology concepts and promoting meaningful dialogue as the participants are able to see the scientific infrastructure in place, touch the product, mingle freely with the researchers and those responsible for policies (legislators and regulators) as well as those actually growing the crops. The Burkina Faso travelling workshop included introductory talks on the broader field of biotechnology after which the farmers toured the research station (INERA) to see the scientific capacities present in the country and eventually visited the Bt cotton trial sites.

“I was able to understand what this technology is all about and to hear from the experts on the ground how the technology, if adopted, could benefit not only my country Burkina Faso but other cotton growing countries in West Africa. In addition to what I saw, I also learned from international speakers that Bt cotton has been growing in other countries such as South Africa, China and India. I was particularly amazed at the socio-economic and environmental gains that farmers in those countries have realized. I had a lot of questions on the safety of the Bt cotton and how we, small farmers are going to access the seed. This workshop was an

“Debates on GMOs are unnecessary because pesticides make many people sick and pollute our environment.”

eye-opener and it clarified the many questions and concerns that I had.”

In July 2008, he planted his first Bt cotton seeds, supplied by INERA, thereby realizing his dream of being a pioneer Bt cotton farmer in Burkina Faso. He can already foresee the wisdom in making the decision to become an early adopter of a technology that many in Africa are still unsure about, thanks to the innovative spirit running through the veins of Burkinabe authorities and scientists. Meanwhile, Ladji says he will be growing conventional cotton varieties as he awaits for the Bt cotton seed distribution system to be fully activated in his home town of Ziro expected in 2009.

Reaching Out to Fellow Farmers

Equipped with the correct information and first-hand experience with Bt cotton, Karim says he has used his position as president of the Cotton Union in his province to reach out to more and more farmers. “My being selected as one of the pioneer Bt cotton seed producers has made my work easier. I am able to explain to the many stakeholders who visit my farm about the technology. I am imparting knowledge to other farmers in my Union and applying what I was taught. My farm now serves as a “classroom” for the many “seeing-is-believing” tours being organized by other stakeholders in the country and the region. Every farmer who comes here goes back with one message – “I will emulate my president,” says Ladji with pride.

Perhaps, the advantages of the new cotton variety is best illustrated by Ladji’s observations: “I have spent less energy on the farm and less money on inputs and other costs with Bt cotton compared to the

conventional one I have been planting that require up to 12 sprays of pesticides and fungicides to get a decent harvest.”

GMO Debate Unnecessary

He wonders why the polarized debate on genetically modified organisms (GMOs) still rages on even when the benefits of such crops are there for all to see. “Debates on GMOs are unnecessary because pesticides make many people sick and pollute our environment,” he adds.

Ladji is thankful to the government, the national research institute INERA, the Burkina Biotech Association and ISAAA *AfriCenter* for ensuring that information on the technology is freely available to the farmers and the general public. Even so, he recommends that a lot still needs to be done to create awareness on the potential of biotechnology

to many more Burkinabes especially farmers in rural areas given the importance of the crop to the country’s economy.

Cotton is an incredibly important crop for the rural economy of Burkina Faso where approximately 3 million people (out of a total population of 14 million) rely on activities related to cotton production and processing for their livelihood. Further, cotton contributes 55 percent of the country’s exports. It is noteworthy that Burkina Faso is the second largest cotton seed producer in the whole of Africa and commercially planted biotech cotton for the first time in 2008. It is estimated that the 8,500 hectares of Bt cotton crop planted in 2008 will provide enough seed for approximately 150,000 hectares in 2009, equivalent to about one third of the total cotton in Burkina Faso. □

EDWIN PARALUMAN

Walking Tall in the Biotech Debate

By Mariechel J. Navarro



Edwin Paraluman is a slightly built farmer from Barangay Lagao, General Santos City, South Cotabato, Philippines. But in recent years he has stood tall in the local and international community as he squarely faced skeptics about biotech crops. “Many anti-biotech groups are neither farmers nor have direct experience in agriculture. I started planting cotton ever since I was a small boy. I have been planting corn for a long time, even before the advent of Bt corn. I know how it feels to be at the mercy of the Asian

corn borer and reaping almost nothing from a corn field due to its infestation. My family always got poor grain quality and small milling recovery with traditional corn due to the corn borer. Even rampant spraying did not solve the problem. Yield reduction with non Bt-corn is around 70 percent. I also had health problems because of what we spray. We found it (pesticides) really hazardous. Farmers’ health suffered. I tried Bt corn and my yield increased from 3.5 tons per hectare to a high of 8 tons per hectare. My life changed,” Edwin

reminisces. “I speak from experience and when I talk, those who oppose the technology literally shut up.”

Edwin comes from a family of farmers. Even if he finished a Bachelor of Science in Commerce degree from the Southern Island College, he opted to continue the family tradition of cultivating the soil for “planting is in our blood.”

Edwin is an active advocate of biotech crops, particularly Bt corn. Naturally curious, he heard about Bt corn from farmers’ testimonials which he read about in farming magazines. He was among the first to inquire about the technology when Monsanto began its field trials in South Cotabato. Since then he has not turned back. Currently, he is the chairman of the Regional Farmers Action Council for Region XI and a member of the Philippine Farmers Advisory Board. As former federation president of Sarangani and General Santos Irrigators Federation, Inc., president of the Nursery Farmers Irrigators Association in General Santos City, and chairman of the City Agricultural and Fisheries Council, Edwin inspires fellow farmers with his success story.

In December 2003, the International Service for the Acquisition of Agri-biotech Applications (ISAAA) organized a pilot capacity-building workshop for farmers in collaboration with the University of the Philippines Los Baños (UPLB), SEAMEO Regional Center for Graduate Study and Research in Agriculture (SEARCA), Cornell University, and the United States Government for farmers from five Asia-Pacific Economic Cooperation (APEC) member economies in Southeast Asia. It was held at the Asian Institute of Management in Makati, Philippines with field visits to Cagayan de Oro City and Los Baños, Laguna. Specifically, the workshop aimed to: increase Southeast Asian farmers’ awareness of the challenges facing agricultural biotechnology, as well as its benefits; enhance farmers’ knowledge of policy issues, based on stakeholders’ experiences with agricultural biotechnology in the Philippines; provide

“Biotechnology has changed many farmers’ lives. Let farmers decide for themselves what crop to plant. It is their choice.”

first hand experience through visits to local farms planting traditional varieties and Bt corn; discuss farmer-level experiences with biotechnology crops; consider the potential role of the farmer or farm-level groups in technology adoption; explore effective communication techniques for farmers to communicate with specific audiences (other farmers, policy makers, regulators, media); and discuss possible formation of a Farmer-to-Farmer Regional Resource Network. Edwin, one of five farmers from the Philippines, was joined by other farmers and media representatives from Thailand, Malaysia, Indonesia, Vietnam, India, and the United States. In the group were community leaders who had won national awards as farmers.

Asian Farmers Network

Topics presented by various international experts were on genetically modified crops, myths and facts about biotechnology, global status of biotech developments, and regulatory process in commercializing biotech crops, while farmers from the Philippines, India, and the U.S. shared their experiences in growing GM crops. Field trips to corn farmers’ fields, a grain processing center, and research institutions, and panel discussions were held with farmers, local government leaders, and individuals doing biotechnology advocacy. A major output of this session was the consensus among the participants to establish a regional farmers’ network to promote the active exchange of experiences and knowledge on alternative modern farming technologies. It was agreed that the network would be called Asian Farmers Regional Network or ASFARNET. Edwin was designated as ASFARNET Coordinator. The network was expected to engage in activities that would ensure responsible



Edwin facilitates discussion regarding the Asian Farmers Network.

farming, accelerate transfer of appropriate modern technology, and ensure community participation in these activities.

The workshop provided participants with insights on GM technology and gave them an opportunity to observe first hand farmers' experiences with Bt corn. "We were unanimous in saying that farmers should be given the right to choose what crop to plant and having alternative crop varieties is important to allow us to make the right decisions," says Edwin. A follow-up workshop was again held in Manila, Philippines in 2006 (*see related article on page 3*) which further honed Edwin's communication skills in delivering key messages of crop biotechnology.

Eventually, Edwin was invited to share his experiences as a corn farmer in many fora around the world. Among them include a World Summit meeting in South Africa where he had his baptism of fire in facing anti-biotech groups. He disarmed them by simply stating that "I am a corn farmer from the Philippines. This corn is good for the farmers."

In 2004, The United States Embassy to the Holy See sponsored an international conference in Rome to examine the potential of biotechnology to help solve the challenge of hunger. An article in the International Herald Tribune notes that "the best assessment of biotechnology's potential came from farmers themselves. Sabina Khoza, a South African maize farmer, and Edwin Paraluman, a corn farmer in the Philippines, told us that their yields and incomes are up, and their use of harmful pesticides is down" (Nicholson, 2004).

Edwin represented ASFARNET in various gatherings where he emphasized the importance of a farmers' network. These include a workshop in Zamorano University, Tigucigalpa, Honduras, and a BIO (Biotechnology Industry Organization) meeting in San Francisco, California, USA where he was subsequently interviewed by several international journalists. A year later he participated in a symposium that was held during the International Day of Maize in Cremona, Italy. "I shared the benefits of Bt corn, particularly the gains on the environment, farmers' health, and better harvest." In a meeting of the Conference of Parties (COP) of the Cartagena Protocol on Biosafety that was held in Brazil, Edwin again shared small-farmer experiences on biotech crops in improving grain yield, reducing pesticide exposure of farmers, and preserving the environment (Asian Farmers Regional Network).

Edwin continues to reap the benefits of being a biotech corn farmer. Aside from higher yield, he notices the significant less use of pesticides and labor. "Bt corn provides me with good quality grains. The cob is really clean and the profits are good. I get satisfied comments from feed processors and animal raisers who buy my corn which has consistently shown low levels of aflatoxin contamination. Biotechnology has changed many farmers' lives. Let farmers decide for themselves what crop to plant. It is their choice." Indeed the man walks tall. □

AGUSDIN PULUNGAN

Hoping to See Indonesian Farmers Benefit from Biotech

By Mariechel Navarro and Bambang Purwantara



The Republic of Indonesia is the world's largest archipelagic state with 17,508 islands. It is the world's fourth most populous country with an estimated 237.5 million people in 2008. The agricultural sector employs about 42% of the total workforce. Major agricultural products include palm oil, rice, tea, coffee, spices, and rubber. Rapid economic growth has transformed Indonesia's food consumption pattern into one characterized by wider variety and greater food demand (CIA, 2008; Bond et al. 2007). The farmer is thus an important contributor in Indonesia's economy.

Wahana Masyarakat Tani Dan Nelayan

Indonesia is an organization that represents the interests of an estimated 800,000 to 1 million farmers and fisher folk in 34 regencies of Java, Sumatra, Sulawesi, and Kalimantan. Based in Cinere Raya Depok, West Java, south of the capital city Jakarta, the organization was established in 1994 to engage in policy advocacy with central government on farmers' issues such as rice importation subsidies, fertilizers and pesticides, price ceilings, irrigation, and agriculture budgetary allotments. The organization is the 'voice' that farmers use to have their demands brought up to government. It also serves as a venue for updates on technological innovations and techniques.

Agusdin Pulungan, chairman of the farmers and fisher folk organization, says that they are also involved in rice seed production which is centralized in Sulawesi and Subang. "We produce stock and extension seeds which we sell to farmers on a commercial scale. Parent seed is produced by research centers of the Ministry of Agriculture which we buy to produce the stock and extension seeds. The organization supplies two percent of the country's seed requirements particularly in Sulawesi, Java, and Sumatra. It is involved in farm to market activities for fruits and vegetables, hence, it facilitates the process by which farmers are able to market their produce wholesale."

The organization is tapped by non-government organizations such as those in Europe to provide information on potential beneficiaries or farmer groups who are given assistance or grants. "We help identify, select, evaluate, and monitor beneficiaries. In one instance, the organization was consulted by the New Zealand Minister of Trade and Agriculture for the farmers' views/position on the DOHA Round to help them negotiate on World Trade Organization issues," says Agusdin.

Farmers, Agusdin explains, are still faced with many problems such as land ownership, fragmented and decreasing farm size, and low productivity of land dependent on inputs. "Farmers remain poor. Nevertheless, farmers are open to new technologies as long as they provide opportunities to improve farm productivity. They do not know much about new technology. They just do the



routinary farming activities. It is organizations such as ours which provide updates on new scientific techniques such as biotechnology to our fellow farmers.”

Farmer-to-Farmer Workshop

The 46-year old Agusdin who finished a degree in agriculture from West Sumatra University in 1986, was updated about the potentials of biotechnology when he was recommended by the then Farmers Union (*see related article on page 19*) chairman to attend the first Farmer-to-Farmer workshop in the Philippines in December 2003. He was one of several farmers who banded themselves to form the Asian Farmers Regional Network or ASFARNET. They agreed to strive to become a collective voice that advocate for “responsible farming and policies toward improving the quality of farmers’ lives and environment.” ASFARNET coordinators of whom Agusdin is one, participated in various activities to fulfill its mission of “sharing information, knowledge, skills and technologies in agriculture and other relevant fields of disciplines to enhance traditional farming, improve agricultural productivity, assure a safer environment, and promote rural development.”



Agusdin at a Farmer-to-Farmer Workshop.

On hindsight, Agusdin says “the farmer-to-farmer workshop enabled me to be updated on latest information about biotech crops and see actual farmers’ biotech corn fields in the Philippines. Farmer leaders were able to interact and exchange information.” He feels that the objectives of ASFARNET are commendable but “opportunities are not maximized because funds are unavailable to push more activities. He noted, however, that the network met its objective of increasing awareness and understanding of the benefits and risks of biotech. We heard from farmers who planted the crop. There should be more opportunities for Indonesian farmers to visit Filipino corn farmers to see how they are doing. It is difficult for governments to collaborate and exchange resources. However we should increase opportunities by which we can rely on the strengths of each country and benefit from them,” the farmer leader elaborates.

The Philippines and Indonesia eventually organized their own country and regional activities to operationalize the goals of the network. ASFARNET Indonesia in collaboration with other partners such as the Indonesian Biotechnology Information Center held a workshop on *Technology Promotion and Exchange of Agricultural Biotechnology* in Bogor, Indonesia in 2004. The workshop aimed to: increase farmers’ awareness of the challenges facing agricultural biotechnology, as well as its benefits; and enhance farmers’ knowledge of policy issues, based on stakeholders’ experiences with agricultural biotechnology in Indonesia and the Philippines.

Participants were able to discuss various views on agricultural biotechnology; exchange experiences and lessons between farmers who have tried, adopted, or marketed biotech crops with farmers who have not yet tried the technology; learn from biotech scientists and industry practitioners; attend field observations to biotechnology research centers (Biotechnology Research Center in Cimanggu, Bogor) and a private company; and discuss and firm

“It (agriculture) is no longer attractive to many young people. However, I still see hope and other opportunities.”

up plans for ASFARNET networking in Indonesia. A resolution was made: Farmers should be able to participate meaningfully in the identification, development, piloting and or transfer of appropriate agricultural biotechnologies as well as in the formulation and advocacy of policies that will affect their lives. Majority of the participants found the workshop useful in helping them to understand benefits and risks of genetically modified (GM) crops as well as policy issues concerning corn crops (SEARCA BIC, 2004).

Agusdin eventually represented ASFARNET in several international meetings and conferences. He attended the Asia-Pacific Economic Cooperation High Level Policy Dialogue on Biotechnology (APEC HLPDB) meetings in Santiago, Chile in 2004 and Seoul, South Korea in 2005. He shared his views about introducing biotech crops to farmers and how they respond to the technology. He appealed to government representatives to allow farmers to use modern technology and gain the benefits experienced by other farmers who have adopted it.

In 2006, Agusdin attended the Association of Southeast Asian Nations – United States Roundtable on Agricultural Biotechnology Policy and Strategy in Bangkok, Thailand. He spoke about ASFARNET during the event that provided an opportunity for ASEAN and U.S. officials to engage in issues pertaining to agricultural biotechnology and economic development. The program emphasized dialogue among the delegations to share their respective positions, clarify goals, and identify potential areas of cooperation on agricultural biotechnology (ASEAN US Roundtable on Agricultural Biotechnology Policy and Strategy).

That same year he was also invited to participate in the Annual General Meeting of the Consultative Group on International Agricultural Research (AGM CGIAR) in Washington, DC. In particular, he attended the first ever Civil Society Forum for civil society organizations (CSOs) where group discussions aimed at identifying lessons learned and new avenues for improved collaboration. CSOs as partners of the CGIAR are perceived to help “shape the agenda of research for development and by enhancing its effectiveness and impact, contribute vitally to accomplishing our shared goals of combating hunger, poverty, and environmental degradation in the developing world” (CGIAR, 2006).

Opportunity for Biotech

The Indonesian farmer continues to be updated on biotechnology. In 2007, he attended the presentation of the global review of commercialized biotech crops at the Ministry of Agriculture which was presented by ISAAA’s chair, Dr. Clive James. Other information sources are the news from the information exchange through an e-group put up by the BIC in the Philippines.

“Biotechnology is a potential opportunity for farmers. Productivity is a farmer’s issue. Hence, any technology that can improve productivity can be considered. We need to keep looking for other high value crops such as corn since rice as a commodity will always be a political issue controlled by government. There will always be concerns such as whether farmers will be able to afford the price of corn seeds. It is also difficult to change the culture of farmers to plant corn instead of rice. Corn is not our staple food so farmers prefer to grow rice,” Agusdin explains. “There is a future for agriculture in Indonesia as it is a lifestyle. It is no longer attractive to many young people. However, I still see hope and other opportunities. We are starting to organize an organic coffee business with a potential to export to Europe. There is a market waiting for our produce.” □

MD. SHAHJAHAN ALI BADSHA

Ready for Biotechnology

By Khondoker Nasiruddin

A farmer in Bangladesh is eagerly waiting for biotech crops to be commercialized in his country. In fact, he is ready to help organize a workshop with the International Service for the Acquisition of Agri-biotech Applications (ISAAA) for progressive farmers to make them aware and be motivated to adopt high-tech innovation including genetically modified crops. "Our farmers are ready to receive the message of their benefits and I hope that they accept biotech crops like they did with new technology during the Green Revolution," says Md. Shahjahan Ali Badsha.

Md. Shahjahan Ali Badsha is the farmer proprietor of Maa Moni Agricultural Farm in Cholimpur, Bangladesh. The 48-year old farmer comes from a farming family. Fighting against poverty, he successfully completed a commerce degree from Jagannath College at the University of Dhaka in 1990. After graduation he took the challenge of improving farming conditions by adopting advanced technologies. He is popularly known as *Pepe Badsha* (Emperor of Papaya) for his success in papaya cultivation and obtaining the highest production in Bangladesh. His farm is planted to other crops such as rice, wheat, maize, pulses crops, oil seed crops, spices, vegetables, and fruits. He was awarded the "Presidential Bronze Medal" in 1991 and the "Bangabandhu Silver Medal" in 1997 for the highest papaya yield in Bangladesh.

Pepe Badsha is greatly recognized for his achievements, hence, several government bodies have made him a member of their committees to provide a farmer's perspective to push agricultural development in the country. These include the Bangladesh Agricultural Research Council, Bangladesh Sugarcane Research Institute, Sher-e-Bangla Agricultural University, and Agricultural



Md. Shahjahan Ali Badsha in his papaya farm.

Technical Committee. He was also tapped to be on the selection committee for the Prime Minister Award in the field of forestry, as well as committees on fertilizer monitoring and irrigation.

The Bengali farmer initially started farming on 0.34 hectare of land when he was a student in 1979. Now his farm is 20 hectares and diversified to include dairy, fisheries and nursery components. He hires about 50 laborers for farming activities. Visitors to his farm include the Agricultural Minister, Secretary of Agriculture Ministry, scientists, professors of different universities, officials of different organizations as well as farmers of different localities in Bangladesh.

Nowadays he is keen on adopting modern technologies, such as tissue culture and biotechnology for product development and marketing for higher profit. He is aware of the need for clean and vigorous seeds, seedlings and sapling production. Some diseases and insect pests are seriously hampering his farm production, thus decreasing his profit. He feels that "biotech crops

against insect pests and diseases would be very helpful in saving the environment from harmful pesticides.”

Awareness About Biotech

Pepe Badsha attended training awareness programs, workshops, seminars and press conferences held on biotechnology. He learned about the technology from ISAAA booklets and leaflets translated into Bengali by the Bangladesh Biotechnology Information Center. He was one of the special guests at the launching of the ISAAA global biotech crops status report at the National Press Club. Since he uses the internet, he is able to access information about the status of biotechnology and biotech crop cultivation in the world as well as in Bangladesh. “I have been planting papaya and I am aware that viruses are a great threat. While attending an ISAAA

workshop, I learned about the Papaya Ringspot Virus Resistant (PRSV-R) papaya program of ISAAA in Southeast Asia. I will adopt this crop once released and I will motivate other farmer leaders to do so too.”

Looking Forward

His future thrust is to make agriculture a profitable business in Bangladesh through agro-based industries that use biotech crops and advanced technologies. He recommends agro-based infrastructure development, domestic and international trainings, and marketing facilities development in Bangladesh. “My Maa Moni Agricultural Farm is a proof that farming can be a successful profession. Bangladesh farmers and the country can benefit by adopting biotech crops in the future.” □



IR. RACHMAT PAMBUDY

Partnering with Government on New Technology

By Mariechel J. Navarro and Bambang Purwantara

Dr. Ir. Rachmat Pambudy is the Secretary General of the **Dewan Pimpinan Nasional, Himpunan Kerukunan Tani Indonesia (DPN-HKTI**, National Leadership Council, Indonesian Farmers Union), the oldest and biggest farmers association in Indonesia. It is a fusion of 14 big farmers’ associations excluding those from the Communist Party. The Chairperson of HKTI is Mr. Prabowo Subianto.

The union “strives to enhance the dignity of farmers as the agricultural primary producers, villagers and other agribusiness actors through the development of a people-oriented agribusiness system.”

Among its concerns are: farmer empowerment, agribusiness development advocacy, campaign for the establishment of pro-farmers development policy, and enhancing the bargaining position of farmers (HKTI, 2008).

Dr. Pambudy notes that Indonesian farmers who come from an agrarian country have a comparative advantage in the agricultural sector. "As a developing country, however, the endowed comparative advantages in agriculture do not immediately reflect on its economic competitiveness. It is quite a challenge for Indonesia to achieve its competitive advantage in agriculture through development of upstream industry, on-farm agribusiness, downstream industry, and other supporting service industries."

He adds that "As a highly populated country, Indonesia has the potential domestic market for agriculture and food products. However, the large population is a burden for the nation to provide adequate amount of quality food." Food security therefore becomes the main issue in both agricultural and national development. "To push agriculture in the country especially during a food (rice) crisis, the government needs a partner in achieving its agricultural program and development. It needs to educate farmers, provide assistance in the diffusion of technology, and deliver inputs such as seeds, fertilizers, pesticides, and new cultural management. Our organization can partner with the government to provide these services to farmers. In addition, farmer leaders are also community leaders. We can use our organization to work together. When there is a national agricultural program, the government seeks our help," Dr. Pambudy explains. From 2001-2004, Dr. Pambudy was adviser to the Minister of Agriculture and remains vigilant and actively committed to let authorities know about issues that affect farmers.

Dr. Pambudy notes that in the globalization era, many developing countries, including Indonesia, are obligated to perform certain actions for trade liberalization. However, developed countries, endowed with ample resources, still implement

a protection policy to support their agricultural sector by giving substantial amounts of aids and subsidies. "As a result, the developed countries can sell their agricultural products to the international market under a competitive price. Moreover, developed countries implement many trade barriers for agricultural products imported into those countries."

Facing such an unfair international trade situation, the government has to implement a protection and promotion policy for agriculture. The promotion policy increases efficiency and competitiveness of domestic agricultural production including the use of high technology such as modern biotechnology. Meanwhile, the protection policy is needed to give "the same playing field" for Indonesian farmers with respect to the international market competition. "These two policies should be done simultaneously, because only by implementing protection can we promote national food development; on the other hand, promotion without protection is the same as doing nothing about unfair trade to farmers. Hence, HKTI also fights for unfair trade and unfair competition in the World Trade Organization forum (HKTI, 2008).

Exposure to Agriculture

A scion of a military officer, Dr. Pambudy's family had a one-hectare land devoted to vegetables, orchids, fresh water fish, poultry, and quail birds which eventually expanded to plantation crops, shrimp production, and forest trees. This exposure to the farm inspired him to take an agriculture course at the Bogor Agricultural University which he eventually joined as faculty in the College of Agriculture. He also worked with the Minister of Agriculture where he was involved in agribusiness development, and later in institutional relations. He joined the Union nine years ago and easily grasped the problems and concerns of farmers and Indonesian agriculture (Tani Merdeka, 2008).



Ir. Rachmat Pambudy (left) represents Indonesian farmers in biotech workshop.

Since Dr. Pambudy represents the interests of farmers, he travels around Indonesia and other countries such as the Philippines, Thailand, Vietnam, Australia, China, Japan, the United States, European and African countries to compare different strategies for agricultural development. He is often invited by the Indonesian Biotechnology Information Center (IndoBIC) as a resource person to talk about the conditions and concerns of farmers. One such workshop was on the use of biotechnology in solving the food crisis which aimed to explore available technological possibilities. "I often tell workshop participants that farmers are eager to know more about new technologies, about better crop varieties that can give better profits and yields." He adds that "farmers are very innovative, ready to change, and want to know what's new. They only need a guarantee that a new product can pay the cost of

production and they can get some profit. That is why the introduction of biotechnology should not be a problem." He notes however that sometimes "farmers use illegal seeds since they do not have access to good seeds. They want to use fertilizers but are unavailable. This could also be a problem with biotechnology if the supporting system is inadequate."

Information for Farmers

Farmer leaders are updated about new technologies such as biotechnology from publications and the radio.

"That is why the role of IndoBIC is very important in getting the message out about biotechnology. We have a farmers' magazine *Tani Merdeka*

(Independent Farmers) which contains articles about various technologies and farmers' issues and concerns that we distribute to farmers in Indonesia. IndoBIC can also use this publication as a channel to update our farmers," says Dr. Pambudy.

The Secretary General believes there is still much to be desired in forging a viable partnership between the government and farmers' associations. "I would like to see that farmers' organizations will one day have their own modern and advanced seed industry, fertilizer and processing plant so they can eventually be self-sufficient. In addition, I hope that farmers will have direct access to information that will help them improve production on their farms and the quality of life for their families. Government and relevant agencies have to help make this possible." □

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