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News and Stories

Strengthening agricultural trade and sustainability: A collaborative effort by USDA, CABI, and FPA in the Philippines

Agriculture plays a pivotal role in the economic development of countries, especially within the Association of Southeast Asian Nations (ASEAN).

In the Philippines, efforts to enhance agricultural trade and promote sustainability took a significant step forward with a recent collaborative meeting hosted by CABI, with support from the United States Department of Agriculture (USDA), for the Fertilizer and Pesticide Authority (FPA) of the Philippines.

Back in March, CABI signed an agreement with USDA Foreign Agricultural Service to work in partnership towards greater harmonization and collaboration on regulatory systems in ASEAN member countries.

This includes a desire to ensure Maximum Residue Limits (MRLs) on crops are set based on science-based principles and international standards as well as and promote the wider use of biopesticide products in the fight against pests confronting farmers.

This meeting, held in Quezon City, marked a continuation of the USDA's global pesticide engagement initiative and aimed to strengthen the country's regulatory capacity in the agricultural sector.

The meeting brought together regulators from various divisions of the Department of Agriculture in the Philippines, including FPA, Bureau of Agricultural Research (BAR), and Bureau of Agriculture and Fisheries Standards (BAFS) Development, along with industry partner CropLife Asia.

Importance of collaborative efforts

Michelle Flavin from USDA-FAS and Dr Sabyan Faris, CABI's Deputy Director, Development, warmly welcomed the participants, emphasizing

the importance of collaborative efforts in achieving shared goals.

One of the primary objectives of the meeting was to discuss existing pesticide regulatory policies and implementing guidelines while charting a roadmap for enhancing regulatory capacity within the Philippines.

Recognizing the need for continual improvement, Julieta B. Lansangan, the OIC Executive Director of FPA, expressed gratitude for the support provided by USDA, CABI, and Crop Life Asia. She highlighted the commitment of FPA to refine its systems and processes, aiming to make them more efficient and reliable in performing regulatory functions.

Mark Hanzel, Agricultural Attaché of USDA-FAS, emphasized the agency's focus on supporting policies that facilitate agricultural trade globally, guided by science and market intelligence.

The meeting marked a continuation of the USDA's global pesticide engagement initiative and aimed to strengthen the country's regulatory capacity in the agricultural sector.

Additionally, USDA places significant importance on addressing food security challenges and assisting countries in improving their agricultural systems, with ASEAN member countries being a priority in this focus.

Great promise for agricultural sector in the Philippines

The collaborative effort between USDA, CABI, and FPA holds great promise for the agricultural sector in the Philippines. By enhancing the regulatory system, establishing new residue limits for registered pesticides, and promoting sustainable practices, this partnership is set to bolster agricultural trade with partner countries. Ultimately, this effort will contribute to the economic development of farmers and ensure consumers' access to safe and high-quality food.

Through dialogue, knowledge exchange, and joint initiatives, USDA, CABI, and FPA are paving the way towards a more sustainable and harmonious agricultural future in the Philippines and the wider ASEAN region.

The stakeholders involved are committed to working hand in hand to achieve specific goals that will have a lasting impact on the efficiency and reliability of the agricultural regulatory divisions.

Sustainable agricultural practices

As we move forward, it is imperative for governments, agricultural organizations, and industry stakeholders to continue collaborating and investing in sustainable agricultural practices.

By supporting agricultural trade and sustainability, we not only ensure food security but also contribute to the overall well-being of communities and the environment.

In conclusion, the collaborative efforts of USDA, CABI, and FPA in the Philippines are commendable examples of how partnerships can drive positive change in the agricultural sector.

With their collective expertise and dedication, they are paving the way for a more sustainable, efficient, and prosperous future for agriculture in the Philippines and the ASEAN region as a whole. By fostering such partnerships and working collaboratively, we can build a brighter and more sustainable future for agriculture and food security worldwide.

Additional information

Main image: Through dialogue, knowledge exchange, and joint initiatives, USDA, CABI, and FPA are paving the way towards a more sustainable and harmonious agricultural future in the Philippines and the wider ASEAN region.

Annual meeting of Anhui-CABI Joint Lab in China highlights scientific progress in crop pest control

Scientific progress is being made in the fight against crop pests including Oriental migratory locusts, spotted-wing drosophila, Phthorimaea absoluta, pepper Phytophthora blight, and maize leaf spot disease.

This is being achieved via the application of ecological control, multidimensional management under climate smart agriculture which was highlighted at the annual meeting of the Anhui-CABI Joint Laboratory for Agricultural Pest Control in Hefei City, Anhui Province, China.

The Anhui-CABI Joint Laboratory for Agricultural Pest Control (hereafter with Anhui Subcentre) was established in 2021 and hosted by the Institute of Plant Protection and Agro-Products Safety, Anhui Academy of Agricultural Sciences (IPPAS, AAAS).

It is a branch of the MARA-CABI Joint Laboratory for Biosafety, based in the Institute of Plant Protection, Chinese Academy of Agricultural Sciences (IPPCAAS), and extends the latter’s partnership and collaboration with Chinese institutions in the field of plant protection.

Dr Feng Zhang, CABI’s Regional Director, East & South-East Asia, and a co-director of the Anhui Subcentre, attended the meeting along with Dr Hongmei Li, Senior Coordinator Research, who presented on CABI’s work to tackle Oriental migratory locusts which threaten crop production in China.

Back in February, for example, a study led by scientists from the Chinese MARA-CABI Joint Laboratory for Biosafety was published in the journal Frontiers in Physiology. It discovered the optimum time to apply safer-to-use and more environmentally-friendly biopesticides to fight the Oriental migratory locust pest.

In respect of the Anhui Subcentre specifically, seven papers were published of which five were published in SCI indexed journals. Six patents were authorised by China and three other country patents in the United States of America, Italy and Belgium.

Throughout 2022, more than 10 experts visited the Anhui Subcentre and staff took part in at least three online international conferences. They included the Talented Young Scientist Program Seminar on Agriculture and the International Symposium on Joint Management of Cross-border Crop Pests in China and Southeast Asian Countries.

2022 also saw the winning of Anhui Provincial Key Research and Development Project, conducting research cooperation and development of non-chemical prevention and control approaches against the fall armyworm, (Spodoptera frugiperda).

The achievements of the Joint Laboratory model and Anhui Subcentre were highly recognised and appreciated by Professor Li Zefu, Vice President of AAAS, and Professor Zhang Jie, Deputy Director General of IPPCAAS.

Going forward, it was highly expected that the Anhui Subcentre will play an important role in strengthening agricultural science and technology collaboration between AAAS and CABI as well as its member country partners along the Belt and Road, particularly ecology-based pest control techniques and green plant protection products.

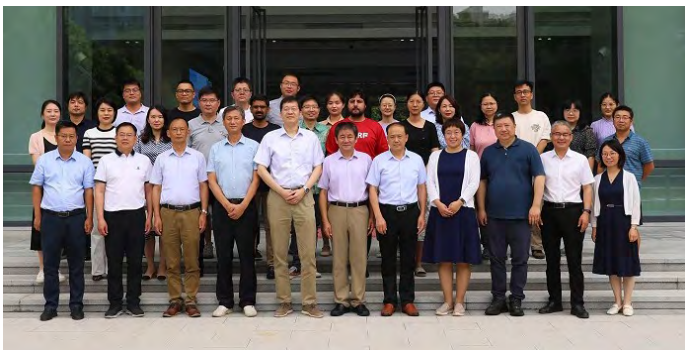
The participants also discussed preparations to celebrate the 15th anniversary of the MARA-CABI Joint Laboratory for Biosafety which will take place between 29 October and 1 November 2023 in Kunming City, Yunnan Province, China.

Two secondments to the MARA-CABI European Laboratory were successfully completed in December 2022 and two certificates were awarded in recognition to Dr Yongzhi Zhong and Dr Xiaoqing Xian respectively.

Along with the Anhui Subcentre, other subcentres are the Yunnan-CABI Sub-centre for Integrated Prevention and Control of Trans-boundary Pests, the Shandong Sub-centre for Biological Control.

In the past year, the MARA-CABI Joint Laboratory for Biosafety, its affiliated European lab and its Chinese subcentres have provide new biocontrol solutions for a range of crop pests and diseases.

These include green mirid bugs (Apolygus lucorum), fall armyworm, brown marmorated stink bug (Halyomorpha halys), spotted lanternfly (Lycorma delicatula), yellow-spined bamboo locust (Ceracris kiangsu), Maize Lethal Necrosis (MLN) disease and wheat aphid (Diuraphis noxia).



Additional information
Main image: Dr Yongzhi Zhong and Dr Xiaoqing Xian receive their certificates for successfully completing secondments to the MARA-CABI European Laboratory during the annual meeting of the Anhui-CABI Joint Laboratory for Agricultural Pest Control (Credit: Anhui Subcentre).

CABI participates in WTO panel discussion on challenges and opportunities for smallholder farmers in international trade

CABI has shared its expertise in agriculture value chain development and market access as part of a panel discussion highlighting smallholder farmers facilitation in international trade organised by the World Trade Organisation (WTO) Informal Working Group on Micro, Small and Medium-sized Enterprises (MSMEs). The event was held to celebrate MSME Day 2023.

Dr Muhammad Faheem, ICM Advisor, based at CABI's regional centre in Malaysia, took part in the event as one of the panellists introducing the CABI-implemented Safer Spices – STDF project in Cambodia, Lao PDR and Vietnam, and also highlighted CABI's experience of supporting smallholder farmers all along the food value chain.

He joined a range of experts including those from The Food and Agriculture Organization of the United Nations (FAO), the Ministry of Agrarian Development and Family Agriculture of Brazil, and the Avoport – a South African supply chain integrator.

In 2021, the Safer Spices project established an office in Vietnam to help support its work to secure market access through improved food safety within the peppercorn value chain. The project aims to achieve this by improving compliance with food safety requirements in high-value markets such as Europe, the USA and Japan.

Challenges smallholder farmers face

The experts, who met online, discussed the challenges smallholder farmers face to access first buyers and global markets; adhere to standards; and navigate the inherent risks and costs. They also talked about what has worked and what more can be done to support these businesses through access to information, infrastructure and logistics.

Smallholder farmers are an important MSMEs, especially in developing economies where roughly 9% of MSMEs are in the agriculture sector (WTO World Trade Report, 2016). These farmers contribute significantly to the global economy and often represent the first link in complex, time-sensitive, food supply chains.

However, many smallholder farmers face a range of issues that hold them back from joining international markets. These include having to comply with strict international standards for Sanitary and Phytosanitary (SPS) requirements at the export level.

The discussion also heard about other issues impeding smallholder farmers' ability to sell their goods to a global market. These included poor farm management practices, a complex supply chain and lack of traceability, limited access to market information, insufficient infrastructure and lack of financial resources.

Questions raised by panellists

Among the questions raised at the panel discussion were those which centred on the actions that policymakers are taking to support the sector, whether access to information is sufficient and what ways in which trade facilitation can be implemented to make the process more accessible for smallholder farmers.

Dr Faheem said, "Over the years, CABI has implemented a range of training approaches to enhance the skills and knowledge of farmers such as farmer field schools (FFS), crop calendar modular training, and the innovative Plantwise initiative. "Plantwise, which comprises a network of plant doctors and plant clinics, has proved instrumental in providing farmers with expert advice on crop health and pest management. Additionally, we have utilized the value chain approach, linking farmers with various actors along the value chain, to enhance market linkages and ensure the sustainability of agricultural practices."

Comprehensive market linkages

Dr Faheem added that while these approaches have been successful in addressing food security, safety, and sustainable production, CABI has recognized a crucial missing component: comprehensive market linkages.

"It is imperative to adopt a holistic value/supply chain approach that covers all aspects, ranging from agricultural inputs, production, harvest, post-harvest handling, and the involvement of market players, right up to the end consumers. By integrating these elements, we can ensure that smallholder farmers not only produce sustainably but also have access to profitable markets," he said.

He further stressed that numerous challenges impede the establishment of strong market linkages.

Dr Faheem added, "These challenges must be addressed, and our policymakers need to take corrective actions and implement measures that will foster stronger connections. During our discussion, we delved into these challenges in greater detail, explored potential solutions and shared best practices."

Actions policymakers can make

The panel discussion highlighted a number of actions that policymakers could make to facilitate trade for smallholder farmers. These included building the capacity of extension staff, improving farmer education and practical training, developing knowledge resources, creating a centralised knowledge platform and strengthening the private public partnership by directly engaging the private sector with farming communities.

Most of international organisation i.e. FAO, CABI, ICC, WTO, WB etc. promoting such program to facilitate the trade with smallholders.

The Safer Spices project, with its Participatory Guarantee System (PGS) model, was hailed at the meeting as a great example of successfully linking smallholder farmers with market players through a mutually agreed code of practice.

Delegates heard that, through joint efforts, the project provided smallholder farmers with the necessary knowledge and skills to negotiate with market players and agreed to comply their required quality and safety standards. By working together, the project has connected smallholder farmers directly with the global spice trade.

Furthermore, CABI's role in the Better Cotton Initiative (BCI) in Pakistan was also highlighted as an example of developing the entire supply chain, including capacity building for smallholder cotton farmers, traceability compliance, and market linkages through ginners, fabric producers, and market sellers.

Investing in agribusiness

The CABI-supported Commercial Agriculture for Smallholders and Agribusiness (CASA) programme was also mentioned as a way in which the development case for investing in agribusinesses, that source produce from smallholders, is made.

CASA is supporting SME agribusinesses, smallholder groups and business groups to increase their productivity and access to markets. While other components of CASA are engaging with investors operating in food systems across Asia and Africa, this component is focused on Nepal (with vegetable and dairy value chains), Malawi (with aquaculture and poultry) and Uganda (with sesame and beans).

Additional information
Main image: market in Vietnam (Credit: CABI).

Surviving the Pakistan floods: reducing fertilizer without compromising food security

The devastation brought about by the monsoon floods in Pakistan left millions displaced and without food, clean drinking water, and shelter.

After major destruction in several areas of Balochistan and Khyber Pakhtunkhwa, the floods inundated major districts of the Sindh province where more than 14 million people alone have been affected by the disaster. Sadly over 500 lost their lives.

Several villages in district Sanghar have been fully submerged and thousands of adobe houses have been destroyed. For miles, the only thing that has been visible is water and tree tops.

Area surveyed

Staff from CABI's centre in Pakistan surveyed the area under which it is working with farmers as part of the Better Cotton Initiative (BCI) project 'Producing better cotton in Pakistan' that is funded by the Better Cotton Growth & Innovation Fund (BC GIF).

This including assessing the district Sanghar. During the survey, it was observed that most farming communities lost their crops and houses and their livestock was starving to death.

Smallholder farmers are particularly vulnerable to natural disasters. Not only were their summer

crops ruined, but they are now struggling to buy seeds, fertiliser and other inputs for their winter crops. This is because prices of all have skyrocketed.

To achieve the goal of producing sustainable cotton, BCI introduced a Better Cotton Standard System (BCSS). This defines the practice-based Principles and Criteria (P&C) to help framers produce cotton in a way that meets BCI social and environmental sustainability standards without sacrificing their crop production.

Fertilizer preparation training

Allah Ditto Jatt is one of the BCI farmers who received training on compost fertilizer preparation. The training was aimed at reducing the dependency of BCI farmers on chemical fertilizer due to an increase in pest attacks on their crops which can threaten productivity and resulting profits.

Better Cotton Initiative (BCI) farmer Allah Ditto Jatt briefs the CABI facilitator on his cotton field (Credit: CABI).

Allah Ditto Jatt said, “I am very pleased to save PKR 8000 on my one acre of cotton crop. I have observed significant transformation in water holding capacity of my soil as compared to other acres of cotton crops. I would like to acknowledge CABI’s efforts in enhancing the capacities of the farming communities in our district without any greed.”

Allah Ditto Jatt hails from the village Qadir Jatt tehsil, Khipro district Sanghar, and is registered as a BCI farmer since April 2022. Previously, he was implementing traditional practices on his farm to grow cotton.

This included using chemical fertilizers on his cotton crops. This costed him almost PKR 16000 per acre – which was way too costly. At that time he was unaware of the modern techniques that can used to protect crops and grow cotton in a more sustainable and profitable manner.

Participatory demonstration

However, a lack of proper knowledge on the process of preparation of compost and its application techniques was hindering the farmers in expansion of its use. Keeping in view the needs and interests of the farmers, a total of 43 farmers from various villages of district Sanghar were trained by field facilitators. This included a participatory demonstration on the compost preparation process.

The training focused on aerated composting and explained the significance of avoiding pest scouting techniques while applying pesticides.

The farmers were advised to cover the compost pits to reduce the loss of moisture and the nutrients at the same time protect from rain to maintain the moisture content in the compost. This is because excess water could result in the decay of the compost.

During the training, the facilitator showed the process on demonstration plots of compost at farm to highlight the impacts of good agricultural practices. It involved observation and a participatory demonstration on the preparation of compost.

This activity intended to provide the participants an exposure to the activities involved in composting and, therefore, upgrade their capacity through self-help for replicating the process independently.

Aerobic composting method

The aerobic composting method was used to develop sufficient compost for one acre of land

by using the following ingredients: 1000 Kgs of poultry manure, 1000 kg of farmyard manure, 40 kg of green manure, 200 kg of banana waste, and 5 kg of urea.

The compost was ready to use in 45 days. During compost development, other local farmers were also present at the plot to learn this applied technique. After compost was applied, farmers witnessed a reduction of two bags of nitrogen fertilizers on cotton crops – much to their surprise.

Allah Ditto Jatt said, "Upon the development of compost, I applied the ready product to my cotton farm, where I witnessed the shocking result in growth of my crops and enhanced water-holding capacity of my soil."

Upon seeing the tremendous results, dozens of other farmers developed and applied compost at their farms and are enjoying its benefits. BCI farmers are increasingly getting attracted towards compost fertilizers and practice of making compost at household level had already been started their own production initiatives.

Additional information
Main image: Better Cotton Initiative (BCI) farmers learn the benefits of compost technology during a demonstration plot activity facilitated by CABI (Credit: CABI).

Potato growers reap the benefits of increased productivity and profits

Meet Ali Azhar and his family. Mr Azhar is a young potato grower who lives in Punjab, Pakistan. Over 95% of the country's potato production originates from this province.

Third generation potato producer

Mr Azhar has followed in his grandfather's footsteps and is a third-generation potato producer on the family's farm in the village Thatha Nonari, Depalpur, Okara district. Here, many small landholders grow potatoes and rely on potato farming for a living.

Despite applying large amounts of fertilizers and pesticides, Mr Azhar had not been achieving a high potato yield. One of the challenges to increased productivity and profits is the lack of quality affordable seed potatoes. Other challenges include limited access to extension services and improper use of fertilizers and pesticides. These hurdles are widespread in Punjab.

About the project

A project called 'Capacity building of small-scale potato growers in Punjab Pakistan' has been working to mitigate challenges faced in the smallholder potato sector. It's been doing this by building the capacity of small-scale potato growers, both men and women, in good agricultural practices. This includes the sustainable and safe use of pesticides.

By using demonstration plots, practical training is given to farmers. Farmers field days and group discussions also help to share best agricultural practices with smallholders. And the development of extension material, such as manuals and leaflets, disseminates knowledge even further. In addition, CABI and district 'master' trainers monitor the farmers' potato crops and help them to overcome challenges.

To improve productivity, smallholders need access to technical knowledge and skills on potato production. There are many advanced potato production practices that farmers can follow. These include:

1. selection of good quality seed varieties
2. proper planting distances
3. fertilization strategies based on soil fertility
4. integrated pest management (IPM) strategies based on pest scouting
5. safe use of pesticides
6. advanced harvest, post-harvest and storage practices

CABI and Wageningen University & Research (WUR), one of the project partners, make recommendations for potato farming and their experts provide advice on how to improve potato yields and quality. In particular, the knowledge is helping Mr Azhar to grow better quality 'ware' potatoes. These are potatoes meant for human consumption, as opposed to seed potatoes which are grown to be replanted. Ware potatoes are sold directly to market for people to buy and eat.

Mr Azhar (left) and the master trainer – proudly showing off the premium quality harvested potatoes (Credit: CABI).

Improving prospects for smallholders

Previously, Mr Azhar experienced massive yield losses in 2020 as a result of using low-quality seed potatoes to grow his crop, and a severe attack of late blight disease.

The project, which is funded by the Netherlands Enterprise Agency (RVO), is improving the prospects for young smallholders like Mr Azhar. One of the ways it is doing this is by establishing demonstration plots. These are small area of land that display the recommended practices to grow ware and seed potatoes. The team has also provided hands-on training on potato production practices to men, women and youth, such as Mr Azhar.

One of the demonstration plots of the ware crop was set-up on Mr Azhar's farm. This plot was established and maintained according to CABI and WUR experts' recommendations.

For comparison, Mr Azhar also established a farmers' plot close to the demonstration plot. Here, he cultivated potatoes according to his traditional practices. After harvesting, the yield achieved from the demonstration plot was approximately 65% higher than the traditional plot.

Higher yield achieved

Mr Azhar said, "After implementing the planting distance, fertilization and integrated pest management (IPM) advice provided by the project team, I was able to plant 40% less of the seed potatoes than I had previously.

"Optimising use of fertilizers, according to soil fertility analysis and a better IPM strategy, not only reduced the cost of production but, importantly, resulted in a higher yield (6.52 metric ton per acre) and premium quality tubers which get higher prices at the local market."

The project is implemented in collaboration with Pakistan Agricultural Research Council (PARC), Department of Agri Extension – Punjab, University of Agriculture – Faisalabad, Punjab Rural Support Programme, Ministry of National Food Security & Research, Potato Research & Development Board – Punjab Potato Growers Society and the Pakistan Farmers Associates.

Additional information

Main image: Mr Ali Azhar (second from the right) and his family with some of their yield which has increased thanks to the capacity building project (Credit: CABI).

PlantwisePlus News & Stories

New biocontrol agent production model to fight fall armyworm in Bangladesh

Fall armyworm attacks wheat amongst many other crucial crops (Photo: Tim Krupnik, CIMMYT)

The state of BCA use in Bangladesh

The use of biological control agents (BCAs) to manage pests is a concept not yet fully embraced by farmers. This is especially true in Bangladesh, where the invasive pest, fall armyworm (Spodoptera frugiperda), has affected many crops. First seen in Bangladesh in November 2018, fall armyworm causes harvest loss and economic damage. Fall armyworm infestations have impacted one of Bangladesh's most important crops, maize. Maize is one of the country's top three major crops, making these infestations particularly devastating.

Using biological control, or biocontrol, is a viable way to control these pests, as it is environmentally friendly and safe for humans. It is a good way to manage fall armyworm if the proper systems are enforced. Although biocontrol research and product development has progressed in the country, their uptake and usage are still lacking.

The main reasons for this are the inaccessibility of bioprotection products and questions about their efficiency. Farmers do not completely understand their use, applications, and methods. Additionally, their high costs, local unavailability, and burdensome regulations make them unappealing to invest in. Another big issue is that there aren't enough existing distribution networks. As a result, farmers have become more dependent on the use of chemicals for fall armyworm management. BCA production is also currently done through a singular business model. This can be limiting to BCA production and usage.

Current BCA production model and how it can be improved

In Bangladesh, private enterprises are in charge of the production of bioprotection products and also

their distribution through dealers. The dealers, usually agro-dealers or individual enterprises, market the biopesticides. Extension agents are also tapped to promote the BCAs to the farmers. This linear business model has been established with BCA production centralized in only one location. The problem with this setup is that the BCAs with short shelf lives cannot reach farmers in farther places. On a structural level, this BCA production model is also problematic as it uses a one-way communication system. Consumers and customers are unable to relay their concerns and feedback back to the enterprises.

This brings up the need for a new model that maximizes BCA production and where contributors can work together. To devise this model, a CABI-led study gathered information. The study, published last year, looked at BCA production and use in Bangladesh through key informant interviews and focus group discussions with relevant people and organizations. The results determined what problems farmers have with BCAs and how BCA production could be revamped to attract them.

Problems caused by the existing BCA production model

The researchers asked different stakeholders about their BCA usage. Agro-dealers in maize-growing locations stated that there is no BCA demand. They said that there is a lack of awareness on the part of the farmers of BCAs and related products. Hence, all the interviewed agro-dealers supply chemical products, while only half stock bioprotection products that manage fall armyworm infestations. This half stated that they can only carry two types of these products due to unavailability and supply inconsistency of others.

The team also asked six farmer-producer organizations (FPOs) about their use of BCAs. The interviews revealed that BCAs ranked low among pest management practices commonly used by farmers. Nevertheless, they stated that half of their constituents were at least aware of BCAs, and 60% of that half are BCA users. This shows that those aware of BCAs and their benefits do tend to use them.

They also identified BCA unavailability in the market as the biggest problem, a result of the current BCA production system. The FPOs further explained that limited farmer knowledge, lack of subsidies, and preference for chemicals were also reasons for low uptake.

Despite this, 67% of FPOs said that their members are willing to pay for BCAs to combat fall armyworm infestations. The ideal price range is from BDT 2,000-5,000 (USD 18-45) per hectare. Customers view anything priced lower as low-quality and anything higher as too expensive.

Proposed solution and improved model for BCA production

This study proposes a solution that utilizes a circular business model, promoting collaboration and sustainability. This non-linear business model involves the participation of four stakeholder groups. At its core, it builds capacity and fosters mentorship between the stakeholders. This creates a support system and allows for the cross-sharing of information and material between each level, improving BCA production.

BCA production would help to control fall armyworm (Photo: Getty / iStock)

The first group is the Bangladesh Agricultural Research Institute (BARI), tasked with capacity building for nucleus culture production. BARI is the largest research institute under the National Agricultural Research System (NARS) and conducts various experiments on agriculture. Their role is to maintain bioassays and trials aimed to improve culture strains. To ensure the integrity of the strain of BCAs produced at farm level, it would be necessary for BARI to test the product from time to time.

The second stakeholders are the regional research centres and extension agents. These scientists will be trained over five years through academic and process-oriented training. In turn, they will train farmers to use the BCAs and how BCA production works. They will also provide starter culture to farmers to assist in production and keep the integrity of the strain.

The third group is the agro-dealers, who provide particulars on fall armyworm management, BCA inputs, and complementary products. They can share information on different products with farmers through different educational materials. Moreover, they could redirect farmers to other sources of BCAs if they themselves cannot provide them. Especially if they did stock complementary products.

Lastly, the fourth group is the FPOs. In Bangladesh, these FPOs are well-established and trained in pest management. In the proposed model, farm entrepreneurs and women's groups will own and operate local BCA production hubs, making it easier to meet demand. The farm entrepreneurs and women's groups who manage the local BCA production units must be affiliated with FPOs to ensure customers. FPOs will also handle awareness creation of BCA production and effectiveness, and guarantee nucleus cultures to the farmers.

What does this business model need in order to operate?

To finance this model, the study estimates that USD 500,000 in capital costs is needed to house 250 million Trichogramma sp. Using this specific BCA for fall armyworm management is effective, as seen in cases in Latin America and Africa. The specific costs required are for laboratory space, culture mass-rearing chambers, chemicals needed in BCA production, and other materials. Plus, annual costs for training, support for production, and dissemination. In addition to the costs for field trials to determine the effectiveness of the BCAs will also be part of the budget.

Aside from this money, long-term financial and technical support, research on sustainability, and policies for incentives can operationalize this model. Further research is also needed to determine if BCA production becomes viable through this method.

PlantwisePlus has been in discussion with local stakeholders such as BARI, commercial entities, and entrepreneurs about opening a pilot facility which would strengthen the regional production of *Trichogramma* in Bangladesh.

About PlantwisePlus

PlantwisePlus is a global programme, led by CABI, to increase incomes and grow safer and higher quality food through sustainable approaches to crop production. Working in close partnership with relevant actors, PlantwisePlus strengthens national plant health systems from within, enabling countries to provide farmers with the knowledge they need to lose less and feed more.

CABI gratefully acknowledges the financial support the Directorate-General for International Cooperation (DGIS), Netherlands; European Commission Directorate General for International Partnerships (INTPA, EU); the Foreign, Commonwealth & Development Office (FCDO), United Kingdom; the Swiss Agency for Development and Cooperation (SDC); the Australian Centre for International Agricultural Research (ACIAR) and the Ministry of Agriculture of the People's Republic of China (MARA).

Meetings and Events

Upcoming meetings and events CABI colleagues will be attending:

- **Grow Asia Investment Forum 2023** | 12 September | Colleagues from CABI's centre in Malaysia will participate in discussions and networking, sharing CABI's work from across the region
- **International Conference on Coffee Science** | 11-14 September | CABI's work on coffee will be presented
- **CABI PlantwisePlus Policy Dialogue on Pest Risk Reduction in Pakistan** | 21-22 September | Taking place in Bhurban, Murree, Pakistan
- **International Symposium on Plant Biosafety** | 29 October-1 November | Co-organized by CABI and the MARA-CABI Joint Lab
- **GLAST 2023** | 25-28 October | Colleagues from CABI's centre in China will attend this event organized by the Chinese Academy of Agricultural Sciences
- **59th International Coconut Community Session & Ministerial Meeting** | 14-17 November | CABI's work on coconut within the region and with ICC Member Countries will be presented
- **International Tropical Fruits Network (TFNet) - Board of Trustees Meeting & International Symposium on Tropical Fruits 2023**, | 21-23 November | CABI's work on value chains and CABI's BioProtection Portal will be presented

Recent Publications

- Wang, B.X., Zhu, L., Ma, G., Najar-Rodriguez, A., Zhang, J.P., Zhang, F., Avila, G., Ma, C.S. (2023). Current and Potential Future Global Distribution of the Raisin Moth Cadra figulilella (Lepidoptera: Pyralidae) under Two Different Climate Change Scenarios.*Biology, 12(3), 435*
- Franić, I., Allan, E., Kenis, M., Li, H., Eschen, R. (2023) Climate, host and geography shape insect and fungal communities of trees.*Scientific Reports, 13:11570*
- Li, H., Wang, M., Li, T., Yin, K., Gu, H., Zhang, F. (2023) Precaution of southern armyworm, Spodoptera eridania (Stoll), potential invasive pest in China.*Journal of Environmental Entomology, 45(2):397-402.*
- Zhang, N., Feng, S., Tian, Y., Zhuang, L., Cha, G., Duan, S., Li, H., Nong, X., Zhang, Z., Tu, X., Wang, G. (2023). Identification, characterization and spatiotemporal expression analysis of the FKBP family genes in Locusta migratoria.*Sci Rep 13, 4048 (2023)*

Other recent stories published on the CABI website

- Brown marmorated stink bug research in China offers promise to prevent the pest spreading in New Zealand
- Pest alert issued for fall armyworm pest infesting rice crop in the Philippines
- CABI strengthens research and publishing ties following visit of Chinese delegation
- CABI's expertise in data policy and practice shared at 2023 Global Digital Development Forum
- Empowering Nepalese students with CABI digital platforms: exploring the PlantwisePlus Toolkit
- Permanent Crop Clinic Programme in Sri Lanka to be strengthened following stakeholder meeting
- PlantwisePlus India: challenges and opportunities
- Pest risk training to help detect Pakistan's potential invaders

Products and Resources

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