PlantwisePlus
Annual Review
2025

KNOWLEDGE FOR LIFE

PlantwisePlus enables countries to face the challenges of plant health threats in a changing climate by empowering smallholder farmers to increase income, food security and food safety by producing more and higher quality food.

Contents

Abbreviations

ACIAR	Australian Centre for International Agricultural Research
AI	Artificial intelligence
BBTD	Banana bunchy top disease
DGIS	Directorate General for International Cooperation (Netherlands)
FAO	United Nations Food and Agriculture Organization
FAW	Fall armyworm
GTWG	Gender technical working group
INTPA	European Commission Directorate General for International Partnerships
IPM	Integrated pest management
IPPC	International Plant Protection Convention
ISABU	Institut des Sciences Agronomiques du Burundi
KALRO	Kenya Agricultural and Livestock Research Organization
KEPHIS	Kenya Plant Health Inspectorate Service
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MLND	Maize lethal necrosis disease
MMB	Mango mealybug
MoU	Memorandum of understanding
NPPO	National plant protection organization
PCPB	Pest Control Products Board (Kenya)
PPRSD	Plant Protection and Regulatory Services Directorate (Ghana)
PRA	Pest risk analysis
PRIM	Pest risk information management
PRISE	Pest Risk Information SErvice
SBC	Social and behaviour change
TVET	Technical and vocational education and training
USDA	United States Department of Agriculture

Executive summary

PlantwisePlus is a global programme that supports smallholder farmers in low- and middle-income countries to produce more food using safer and sustainable crop production practices, thereby improving food security and rural livelihoods. The CABI-led programme engages hundreds of diverse partners and operates from policy to practice: supporting governments to predict, prevent and manage pest threats, while equipping public and private advisory services with the gender-sensitive tools and training needed to promote lower-risk pest management and sustainable crop production.

Through its three interconnected impact pathways (pest preparedness, pesticide risk reduction, and farmer advisory), PlantwisePlus implementation in 2025 was focused heavily on **institutionalization, national ownership, and long-term sustainability** across target countries in Africa, Asia-Pacific and the Americas. For many of the programme interventions, there was a strong focus on increasing local and/or national ownership to ensure sustainability, and on demonstrating the outcomes and impact on smallholder farmers.

Under the **pest preparedness impact pathway**, PlantwisePlus advanced its capacity building for national plant protection organizations (NPPOs) and associated stakeholders through national and regional activities. For instance, regional pest risk analysis (PRA) workshops using the PRA Tool in Africa and the Caribbean led to more co-ordinated, scalable and evidence-driven pest risk management approaches. There was also strong progress in the compilation and management of national pest risk registers and the development of national response plans for pests identified as highest priorities. In collaboration with the European Food Safety Authority, PlantwisePlus facilitated the creation of a global network dedicated to identifying and responding to emerging plant health threats.

PlantwisePlus made significant progress in 2025 on **pesticide risk reduction** interventions. Through its whole system approach, the programme strengthened regulatory oversight, expanded access to lower-risk products, promoted farmer behaviour change and built national capacity for biological control. At the policy level, PlantwisePlus supported national authorities to develop comprehensive guidelines for the re-evaluation of registered pesticides, which represents a fundamental shift in how governments approach pesticide governance: from occasional, reactive reviews towards a planned, evidence-based process that systematically re-examines active ingredients. At farm level, training and awareness raising through multiple gender-inclusive campaigns increased awareness and understanding of risks associated with chemical pesticides and alternative pest management approaches. These combined efforts contributed to achieving large-scale, long-term progress towards a more sustainable and climate-resilient food system.

Under the **farmer advisory** impact pathway, PlantwisePlus made significant progress in extending advisory coverage, strengthening resilience, and enabling smallholder farmers to manage their crops more sustainably and profitably. The multifaceted programme interventions targeted existing public sector extension workers, agro-input dealers, and private agri-service providers.

The programme also continued to make a **strong scientific contribution** in 2025, with 32 publications during the year. These comprised 19 peer-reviewed and open-access journal articles**,** alongside policy briefs, working papers and book chapters, with subjects spanning PRA, biological control, pesticide risk reduction, gender-responsive advisory systems, digital decision support tools and rural entrepreneurship. Collectively, this body of work strengthens the programme's evidence base and supports improved plant health policy, advisory practice and biosecurity decision-making.

Notable achievements across the programme for 2025 included the following:

Awards:

- The United Nations Food and Agriculture Organization (FAO) awarded CABI a Global Technical Recognition Award for its work on sustainable plant production and protection, including PlantwisePlus and the CABI BioProtection Portal.
- The CABI BioProtection Portal won the Gold Stevie Award for Sustainability Initiative of the Year in Europe. The Portal was praised as "an excellent tool empowering farmers globally with safe, sustainable pest solutions."

Pest preparedness:

- CABI and the European Food Safety Authority established the first Plant Health Community on the World Health Organization's Epidemic Intelligence from Open Sources (EIOS) platform, for global monitoring of plant health threats.
- The PRA Tool received over 7,500 visits and the Horizon Scanning Tool over 1,600 visits from PlantwisePlus countries, representing 78% and 69% of their total global traffic, respectively. This reflects continued strong uptake within priority countries.
- Eight countries now maintain their own national pest risk registers (Ghana, Kenya, Pakistan, Bangladesh, Sri Lanka, Rwanda, Uganda, Zambia).
- Surveillance activities were undertaken for six priority pests in seven countries across Africa and Asia.
- National pest response plans were updated for one focal pest in each of Uganda, Rwanda, and Bangladesh, following changing risk patterns, disease detection and identification of significant crop loss risks.
- Pest Risk Information Service (PRISE) alerts reached over 1 million smallholder farmers, increasing integrated pest management (IPM) adoption by 8–32% and improving crop yields and incomes by 18–26%.

Pesticide risk reduction:

- Bangladesh, Kenya and Uganda developed and piloted systematic pesticide re-evaluation guidelines. In Kenya, this led to a decision to revoke three hazardous active ingredients.
- Kenya's National Pesticide Residue Monitoring Framework advanced through a successful pilot phase, demonstrating potential to improve co-ordination, data sharing and food safety oversight.
- Over 26,000 stakeholders were trained and more than 1 million farmers reached through social and behaviour change (SBC) campaigns, with evidence of safer pesticide practices and increased IPM and biopesticide uptake as a result.
- The papaya mealybug biocontrol agent is suppressing infestations across 4,700+ hectares (ha) in Kenya, with farmers reporting increases in income of over 50%.
- Pakistan is planning a major scale-up of biocontrol production, including a new *Trichogramma* facility in Punjab and six more in Khyber Pakhtunkhwa, funded by the provincial governments.

Farmer advisory:

- There were 31.9 million instances of smallholder farmers receiving plant health and pesticide risk reduction advice (5.6 million directly, and a further 26.3 million indirectly), contributing to increased yields for 1.8 million farmers and increased incomes for 1.9 million farmers.
- 38% of stakeholders reached identified as women, exceeding the programme's target of one-third.
- 2.3 million engaged users accessed the PlantwisePlus digital advisory tools and the CABI Academy in 2025.
- In India, users of digital tools adopted more IPM approaches, were 55% more likely to use biopesticides, reduced hazardous pesticide use, and increased profits by 23%.
- 790 private agri-service providers delivered IPM-based advisory services to 24,000 farmers, achieving strong cost-effectiveness (benefit–cost ratio of 47:1) and farmer income gains of up to 30%.

Programme implementation in 2026 will continue to concentrate on strengthening partnerships to achieve ever stronger delivery of activities and impact, while facilitating the integration of these activities into partners' formal workflows. An important step towards securing local ownership is demonstrating the positive outcomes of the interventions. Further evaluations of specific outputs to be conducted in the coming year will help to provide that evidence, while also enabling crucial learning for CABI and its partners.

There are plans for some gradual scaling up of certain activities in 2026, but this will be limited due to the reduced overall programme budget. Most scaling of activities to new countries will be dependent on previously initiated interventions reaching a point of sustainability where CABI can wind down its direct support, as has already been seen in some cases. The constraints of a lower budget in 2026, plus numerous geopolitical instabilities, will require CABI and its partners to closely monitor the operating environments and the implementation progress within them to achieve the greatest impact possible.

Introduction

Food security, food safety, and agricultural sustainability remain urgent global priorities in the face of climate change, biodiversity loss, and growing demand for safe and nutritious food. Crop losses due to pests and diseases continue to undermine productivity and farmer incomes, while expanding pest threats and increasing pesticide use pose risks to human health, ecosystems, biodiversity and trade. Smallholder farmers, particularly women and young people, remain disproportionately affected by these pressures, often facing systemic barriers to accessing reliable advisory services, markets, and advisory tools. Strengthening plant health systems is therefore central to building resilient, inclusive and sustainable food systems.

PlantwisePlus is a global programme led by CABI. It brings together governments and other in-country partners to strengthen national plant health systems. The programme promotes sustainable crop production through IPM and pesticide risk reduction, which aligns with the principles of agroecology and climate-smart pest management. These approaches reduce crop losses while protecting human health, biodiversity, and soil health, and lowering reliance on high-risk synthetic pesticides. In doing so, they support climate resilience, safer food production, and more sustainable agricultural growth.

The programme combines digital innovation with face-to-face capacity development. It equips agricultural service providers with reliable, science-based information to improve the quality and reach of the advice that is available to farmers. By working through national institutions and existing delivery systems, the programme builds local ownership and long-term sustainability of the interventions introduced. This contributes to improved livelihoods, reduced environmental and health risks, and more resilient agricultural systems.

Activities delivered under the programme are both global and country-specific. Countries that implemented programme activities in 2025 are highlighted in the map (**page 10**). The focus countries were Kenya, Ghana, Pakistan, Zambia, Uganda, Bangladesh and Sri Lanka. In addition, the wider programme supported 18 core countries and affiliate projects supported an additional two countries across Africa, Asia-Pacific and the Americas to strengthen plant health systems and build capacity among agricultural advisory and extension providers.

In 2025, the programme focused on consolidation and deeper institutional integration. Building on earlier progress, greater emphasis was placed on embedding established tools and approaches within national institutions and governance frameworks. PlantwisePlus digital systems, training curricula, and biological control innovations were increasingly integrated into government agencies, research institutions, universities, and relevant private-sector actors. Activities were aligned with national plant health strategies, extension systems, and pesticide regulatory frameworks to strengthen country ownership and support long-term sustainability.

This annual report also references affiliate projects implemented in 2025 that contribute to the overall reach and impact of the global PlantwisePlus approach. Activities in Burundi and China were supported exclusively through affiliate projects in 2025.

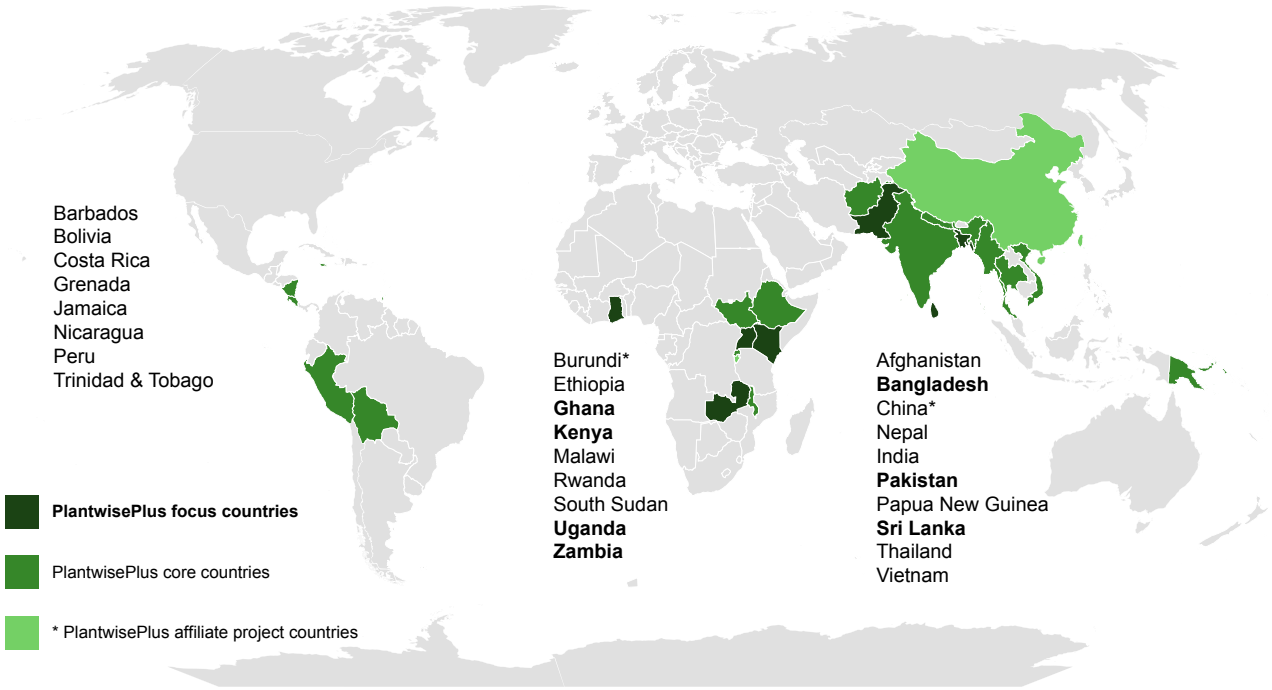


Figure 1: The seven PlantwisePlus focus countries are shown in dark green and bold text. The 18 core countries appear in medium green. Countries marked with an asterisk and shown in light green are supported exclusively by PlantwisePlus affiliate projects.

The following donors supported the global implementation of PlantwisePlus in 2025: the Directorate-General for International Cooperation of the Netherlands (DGIS); the UK Foreign, Commonwealth and Development Office (FCDO); the European Commission Directorate-General for International Partnerships (INTPA); and the Swiss Agency for Development and Cooperation (SDC).

Additional country- and activity-specific funding was provided by collaborating partners, including the Embassy of the Netherlands for Burundi and the Ministry of Agriculture and Rural Affairs of the People's Republic of China for China.

This report presents an update on PlantwisePlus's implementation between January and December 2025. It outlines progress across the programme's three impact pathways: pest preparedness, pesticide risk reduction, and farmer advisory. Pest preparedness strengthens the detection of and response to emerging pest threats. Pesticide risk reduction promotes the use of lower-risk plant protection solutions and safer food production. The farmer advisory pathway enhances the capacity of public and private actors to support farmers effectively. The report describes selected highlights, challenges, and progress relating to the 11 outputs of the programme's scale-out phase, following the three-impact-pathway structure.

Programme highlights

Activities in 2025 aimed to strengthen pest preparedness through improved co-ordination, surveillance, and risk assessment to reduce vulnerability to emerging threats. Pesticide risk reduction approaches were further integrated into regulatory and advisory services to promote lower-risk plant protection practices. Gender- and youth-responsive models were embedded within extension systems to improve inclusive access to support. Government-supported systems for biological control were strengthened to improve their reliability and long-term functioning. Digital advisory tools were increasingly incorporated into national information platforms.

By working through national structures rather than creating parallel mechanisms, PlantwisePlus supports countries to sustain and expand programme interventions independently. As institutional capacity strengthens, activities are extended to new contexts where readiness and demand are evident. Scale-out is pursued strategically, focusing on countries where core systems are sufficiently established to support a gradual transition of programme resources. This measured approach promotes responsible resource use, long-term resilience, and sustainable impact.

Pest preparedness

Increasing trade and travel, combined with shifting weather patterns, are accelerating the spread of invasive pests and driving more frequent and unpredictable outbreaks of existing threats. These climate-driven and globalized pathways heighten risks to smallholder livelihoods, food security, biodiversity and trade systems. In response to this challenge, PlantwisePlus has strengthened pest preparedness across multiple countries, enabling NPPOs and plant health stakeholders in Africa, Asia-Pacific and the Americas to better **predict, prevent and prepare** for emerging risks. By reinforcing national systems to assess, prioritize, and monitor pest threats, the programme has supported more **climate-resilient** and **inclusive** approaches to risk management. As a result, countries are better equipped to plan and implement targeted response measures for priority plant health threats, protecting farmers' incomes and safeguarding sustainable, safer production systems.

Identifying and prioritizing national and regional pest threats

As pest risks continue to grow, prioritizing the most significant threats is essential in order to deliver effective and cost-efficient pest preparedness. Clear prioritization enables countries to focus limited capacity and investment on the pests that pose the greatest risks to agriculture, biodiversity and trade, maximizing the impact of prevention, surveillance and response efforts.

PlantwisePlus supports this prioritization through a **practical, evidence-based approach** that strengthens national and regional decision-making. Analytical tools such as CABI's Horizon Scanning Tool and PRA Tool enable NPPOs to identify priority threats and target action where it matters most. The PRA Tool received over 10,900 visits in 2025, of which 7,571 were from the 25 PlantwisePlus countries supported by core programme donors. The Horizon Scanning Tool recorded nearly 2,900 visits, of which 1,623 were from the 25 PlantwisePlus countries. This strong global uptake is contributing to more co-ordinated, scalable and evidence driven pest risk management. **Priority risks** identified by stakeholders using these tools are consolidated within national pest risk registers. These pests are systematically scored based on their likelihood of entry, potential for establishment, and socio-economic and environmental impacts, including risks to smallholder farmers, women and youth, and key export crops. This enables NPPOs to track and regularly review priority risks and respond to new evidence as it emerges. Through this process, countries are better able to take timely, informed decisions to prevent or prepare for pest incursions.

In 2025, the PlantwisePlus approach to pest prioritization expanded to Nepal and Sri Lanka, where a **crop-focused horizon scanning methodology** was applied to identify pest risks affecting nationally important crops. This marked the first time that a crop-specific horizon scanning approach was used under PlantwisePlus, creating an opportunity to refine the methodology. It resulted in a practical and actionable list of pest priorities to inform subsequent preparedness activities, including pest risk monitoring and surveillance. Building on this experience, crop-specific interventions will also be initiated in Malawi, Ethiopia and Papua New Guinea in 2026.

There was also strong progress in the compilation and management of **national pest risk registers**, a concept that was adapted from the model developed by the Department for Environment, Food and Rural Affairs (Defra) for the UK. In countries where pest risk registers were established through PlantwisePlus in previous years (i.e. Bangladesh, Kenya, Ghana, Zambia and Pakistan), the programme continued to support NPPOs in convening working group meetings to review and update priority risks. Across both newly supported and longstanding focus countries, these working groups are increasingly taking ownership of pest prioritization and preparedness, advancing sustainability and long-term institutionalization. Pest risk register working groups and associated committees were established in Rwanda, Uganda and Sri Lanka in 2025, extending systematic pest risk management to additional countries. In Uganda, the pest risk register working group has demonstrated particularly strong engagement, with CABI providing some backstopping to strengthen committee structures and build capacity to sustain these efforts over time.

Alongside prioritization, PlantwisePlus is strengthening **pest risk monitoring** to ensure countries can respond rapidly to changing threats. In collaboration with the European Food Safety Authority, CABI established the first Plant Health Community on the World Health Organization's EIOS platform, creating a global network dedicated to identifying and responding to emerging plant health threats. Through this collaboration, CABI synthesizes **global intelligence** into pest risk information management (PRIM) reports. This approach enhances early warning systems, aligns cross-border responses and facilitates faster, co-ordinated decision-making.

In 2025, CABI shared monthly PRIM reports with NPPOs in Ghana, Kenya, Zambia and Uganda, strengthening early warning and response to priority pests under the International Plant Protection Convention's (IPPC's) new Pest Outbreak Alert and Response System (POARS). Building on this progress, PRIM reports will be expanded in 2026 to all countries with pest risk registers and to regions with established priority pest lists, with outputs shared through the IPPC network and regional plant protection bodies in Africa and Asia, further strengthening collective preparedness and global biosecurity.

Raising pest awareness and supporting early action

Following the identification and prioritization of pest threats and assessment of their potential impacts, CABI worked closely with national partners to develop **pest response plans**. Response and contingency planning are centred on high-risk pests identified through horizon scanning, with plans developed or updated in response to changes in risk recorded in national pest risk registers. This proactive approach aims to minimize the introduction, establishment and spread of new crop pests by strengthening early detection and rapid response, supported by sustained surveillance and timely interventions that protect livelihoods and agricultural productivity. As part of a response plan, effective communication campaigns support early detection, informed farmer action, and the prevention of pest and disease spread. In 2025, PlantwisePlus supported partners in Kenya, Uganda, Zambia and Ghana to design targeted communication campaigns that provide farmers with timely guidance on sustainable pest management using IPM approaches. These efforts combined mass media, training, and community-based engagement to address priority pest risks.

> "Farmers are now better able to recognize signs of infection and are more likely to alert agricultural officers quickly when they observe unusual symptoms. This is indeed a crucial step in making sure that we are not taken unawares by another destructive pest as [we were with] the fall armyworm."

Victus S.K. Buoh, a Municipal Agricultural Officer from Ghana, describes how awareness-raising campaigns have improved farmers' ability to detect key pests.

Horizon scanning activities undertaken by NPPOs prioritized several key pests for surveillance, including mango mealybug (MMB) in Uganda and Kenya, maize lethal necrosis disease (MLND) in Rwanda, banana bunchy top disease (BBTD) in Ghana, black thrips in Bangladesh, spiralling whitefly in Pakistan, and wheat blast in Zambia. The actions taken against some of these prioritized pests are described here.

In Ghana, horizon scanning conducted by the Plant Protection and Regulatory Services Directorate (PPRSD) ranked **BBTD as a high-priority pest**. This reflects the economic importance of banana and plantain to the country and the severe global impacts of BBTD on production. The disease has been reported in 19 countries, including the nearby countries of Benin and Nigeria, increasing the risk of further spread into Ghana. Socio-economic studies undertaken by PlantwisePlus further highlighted the vulnerability of banana and plantain producers, showing low farmer awareness of the disease and the insect (an aphid) that spreads it, and the potential for severe yield and income losses should BBTD become established (2 to 12 tonnes per hectare of yield loss and income losses up to 100%). Consequently, PPRSD prioritized the pathogen for immediate action.

PlantwisePlus also supported some of the surveillance activities for BBTD in Ghana in 2025. Samples were collected from 13 districts across the Eastern, Greater Accra, Oti, and Volta regions. Plant samples and specimens of the banana aphid vector were collected and analysed using molecular techniques, performed by the Ghanaian Plant Disease Research Centre at the Biotechnology and Nuclear Agriculture Research Institute (BNARI). Results were negative for BBTD when compared with DNA-positive controls, indicating that the disease was not found in the surveyed districts and communities. Despite surveillance indicating that the disease was not present, the situation in neighbouring countries and the new information on potential economic losses gleaned from the studies mentioned above necessitated an update to the response plan to address the evolving risks. The updated response includes more stringent guidelines for planting materials entering Ghana and improved inspection protocols to protect banana/plantain production and the market.

As part of the response plan, **pest risk communication activities** were implemented in partnership with PPRSD. Inspection guidelines for BBTD were distributed to advisors and phytosanitary inspectors were trained to identify and report the disease. Building on this training, BBTD awareness campaigns were conducted in four districts of Volta Region. The campaigns reached over 1,500 farmers through 28 community-level sensitization activities, empowering farmers as first-line surveillance agents who are able to recognize and report suspected cases to extension agents.

MMB was first reported in Uganda in 2021, in a hotspot in Ntungamo District, in the Western Region of Uganda. PlantwisePlus has supported the country in managing the pest in the hotspot area by contributing to an ongoing biological control strategy initiated by FAO and the International Institute of Tropical Agriculture (IITA). PlantwisePlus is also assisting in the rapid detection and response to new or sporadic outbreaks outside hotspot areas. In 2025, surveillance targeted high-risk districts in the Western, Central, and Eastern regions of Uganda.

A total of 143 survey sites were covered across 16 districts, and no typical signs of MMB infestation were observed. Even in the original hotspot district of Uganda where the pest had previously been detected, there was no evidence of its presence. This suggests that the biological control agent and pest risk communication campaigns promoting IPM-compatible practices are having a positive impact. These latest results led to an update of Uganda's national response plan for MMB.

The risk awareness raising campaign in Uganda mainly took the form of radio programmes focused on early pest detection and reducing pesticide use to conserve the natural enemies of MMB. Radio is an inclusive and wide-reaching medium and its use helped ensure that both men and women farmers, including those in remote areas with limited access to extension services, received timely pest management information. These **mass communication activities** reached approximately 197,000 farmers and were complemented by 60 face-to-face plant health rallies implemented by plant doctors that engaged a further 2,104 farmers.

In Kenya, surveillance has not detected any evidence of MMB presence. Nonetheless, the risk to Kenya is still considered high, particularly in high mango production areas like Makueni, Machakos and Kitui counties, which have similar environmental characteristics to regions where MMB has established itself in Uganda. PlantwisePlus therefore supported Kenyan authorities to focus on prevention through early warning and preparedness. Sixty-five people from Makueni County Government, Keitt exporters, and the Makueni County Fruit Processors Cooperative were trained on MMB identification, prevention and management, with a strong emphasis on prompt reporting of suspected cases. The trained service providers disseminated pest alert messages through flyers and farmer networks, reaching an estimated 5,000 farmers, while county extension teams engaged up to 10,000 registered farmers through their databases.

Proactive strategies for banana bunchy top disease prevention in Ghana

Since 2019, CABI has supported partners in Ghana to prepare for the potential invasion of one of the world's most destructive banana and plantain diseases, Banana Bunchy Top Disease (BBTD). CABI worked in collaboration with the Plant Protection and Regulatory Services Directorate, the Biotechnology and Nuclear Agriculture Research Institute, the District Food and Agriculture, the University of Ghana, the International Institute of Tropical Agriculture, the Directorate of Agricultural Extension Services, the Environmental Protection Agency, and the Council for Scientific and Industrial Research.

Potential economic impact on banana production

Yield loss

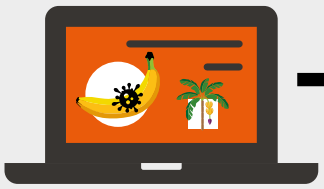
2.4–12.0 t per ha

Income loss (up to 100%)

US$289–1,444 per ha

Pest risk identification

Horizon scanning



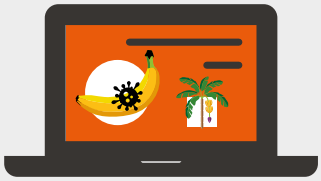
Pest risk analysis

Extremely high risk

Response plan

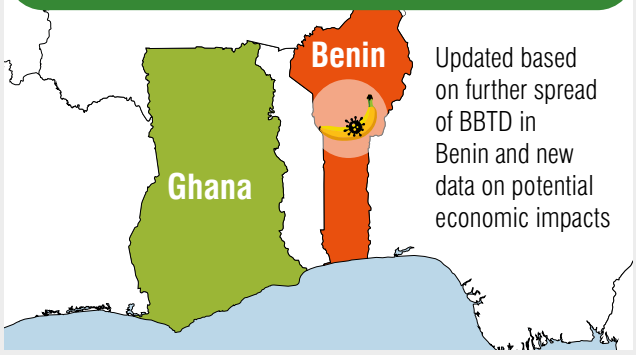
- **Restrict movement** of planting materials
- **Rapid diagnostics and detection** tools
- **Destroy infected plants** and source **certified planting materials**

Surveillance activities



13 high-risk districts

Response plan revised



Updated based on further spread of BBTD in Benin and new data on potential economic impacts

Pest risk awareness

A risk **communication campaign** highlighted the risk of BBTD among key stakeholders.

Evidence note produced to inform policy and support biosecurity decisions

24 advisors and inspectors trained

1,508 farmers reached across 28 high-risk communities

MLND continues to pose a serious threat to maize production in Rwanda, having first been recorded in Northern Province in 2013. In response to the recent re-emergence of this disease as a key challenge, PlantwisePlus supported Rwanda in updating its MLND response plan, reflecting the evolving risk of the disease. Surveillance activities were also undertaken, confirming the presence of MLND in maize fields across several maize-growing regions of the country. This led to the development of a specific pest risk communication plan for MLND to raise awareness and promote actions to limit the spread of the disease in the country.

In Bangladesh, horizon scanning conducted in 2024 identified **black thrips** as an imminent threat to chilli production and a priority for further action. Subsequently, surveillance undertaken in 2025 revealed that the pest is becoming established in several regions of the country. With PlantwisePlus support, partners finalized a black thrips handbook, which is a comprehensive resource for pest identification, management and awareness, alongside a national response plan.

Providing farmers with direct, timely and accurate pest preparedness information

As part of its timely response to existing pest threats, PRISE continued to deliver **early-action pest alerts** to farmers in Kenya, Zambia, Malawi and Ghana. The alerts focused on key crop–pest combinations affecting smallholders, including maize (fall armyworm (FAW) and stem borers), beans (bean stem maggot and legume pod borer) and tomato (tomato leaf miner). PRISE also shared pest alert bulletins (including map-based risk information and pest management recommendations) with plant doctors and farmers through mobile phones.

In Kenya, PRISE collaborated with the Kenya Agricultural and Livestock Research Organisation (KALRO) to deliver time-to-act alerts and good agricultural practice messages to an average of 1,050,666 farmers per month during the 2025 growing season. In Ghana, Malawi and Zambia, over 450 plant doctors disseminated PRISE bulletins to more than 2,700 farmers via Telegram and WhatsApp. In 2026, PRISE dissemination activities will continue, with further exploration of opportunities to expand PRISE alerts in Ghana and Malawi.

A feedback survey to assess the timeliness and clarity of PRISE pest advisory SMS messages was conducted in Kenya and Zambia. In Kenya, more than 80% of the 217 farmers interviewed reported receiving the advisory messages on time, and respondents in both countries found the messages clear and easy to understand. Participation was strong across locations, with women accounting for 40% of participants and with good representation across farmer age groups, demonstrating the value of PRISE as a mechanism for ensuring **inclusive advisory services**. Farmers also reported that the advisories were well aligned with key planting periods, supporting timely decision-making.

Furthermore, a rigorous impact study analysed survey data from more than 4,000 smallholder farmers in Ghana, Kenya, Malawi and Zambia and found that access to PRISE pest alerts increased the **adoption of IPM practices** by 8–32%, alongside facilitating gains in crop yield and income of 18–26%.[1] The findings demonstrate that timely access to pest risk and management information can substantially improve farm productivity and incomes across Africa.

1. Khonje, M.G., Tambo, J.A., Taylor, B., Day, C. and Williams, F. (2026) Provision of pest alerts is associated with better farm performance in Africa. *Pest Manag Sci* 82, 340–347. **https://doi.org/10.1002/ps.70196**

Pesticide risk reduction

The risks posed by synthetic pesticides to human, animal and environmental health are increasingly recognized around the world, yet progress in shifting to lower-risk crop production methods remains uneven in many countries. Farmers continue to rely heavily on highly hazardous pesticides, and are often without access to appropriate information, alternatives or supportive policy environments that would allow them to transition confidently towards lower-risk, more sustainable plant protection approaches.

PlantwisePlus works across national plant health systems to accelerate the transition lower-risk crop protection methods. In 2025, the programme deepened its partnerships with governments, regulators, researchers, the private sector, civil society, and farming communities to promote lower-risk IPM solutions, including bioprotection and biological control.

Through this **whole system approach** – from more rigorous regulatory oversight to expanded access to lower-risk plant protection products, and from behaviour change to strengthened national capacities for biological control – the programme contributed to large-scale, long-term improvements towards a more sustainable and climate-resilient food system.

Identifying and promoting lower-risk alternatives to synthetic pesticides

Strengthening regulatory systems for long-term impact

A central focus of PlantwisePlus in 2025 was working with regulators to adopt more rigorous and more transparent processes for synthetic pesticide registration. These reforms take time to implement, but in the long term they lead to **sustained changes** in synthetic pesticide availability and use, which will safeguard communities well beyond the life of the programme.

Across Bangladesh, Kenya and Uganda, regulators and other stakeholders recognize that their existing systems struggle to keep pace with emerging evidence. Synthetic pesticides often remain registered when new data highlight unacceptable human or environmental risks. Ad-hoc reviews are often met with resistance from the agrochemical industry for fear of trade disruption, and from farmers who plan to use the affected plant protection products. To address this challenge, PlantwisePlus supported national authorities in these three countries to develop **comprehensive guidelines** for the re-evaluation of registered pesticides. These guidelines represent a fundamental shift in how governments approach pesticide governance: from occasional, reactive reviews towards a planned, evidence-based process that systematically re-examines active ingredients.

In Bangladesh, PlantwisePlus supported the formation of the Pesticide Risk Reduction Technical Working Group, bringing together government, academia and the private sector. The working group was tasked with assessing synthetic pesticide use, promoting lower-risk alternatives like IPM, strengthening co-ordination, and raising public awareness. A first meeting led to the initial step of developing guidelines for a systematic review of registered synthetic pesticides. In 2025, the guidelines were drafted and went through the first validation phase. The next steps will involve finalizing the guidelines, conducting sensitization sessions for the Plant Protection Wing of the Department of Agriculture, and piloting the prioritization and review process for selected active ingredients.

In Kenya and Uganda, CABI collaborated with the Pest Control Products Board (PCPB) and the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), respectively, to share knowledge and experiences on post-registration review guidelines and systems relating to pesticides. A **regional webinar** brought together stakeholders to exchange insights and identify practical ways to strengthen post-registration review systems. Experts from PCPB, MAAIF, and the Swedish Chemicals Agency (KEMI) shared experiences from Kenya, Uganda, Sweden, and the European Union (EU), and global perspectives from the FAO/World Health Organization Joint Meeting on Pesticide Management (JMPM). The session covered best practices, the importance of post-registration reviews for pesticide risk reduction, and strategies for improving regulatory frameworks and stakeholder engagement. In total, 130 participants from Kenya, Ghana, Uganda and Sweden, including regulators and representatives from the agrochemical industry umbrella association (CropLife), attended the webinar.

PCPB, with the support of CABI, led meetings to develop draft post-registration review guidelines, incorporating key lessons learned from the previous discussions about processes, scientific evidence and public consultation. Senior decision makers reviewed and endorsed the drafts, and the guidelines will be piloted in 2026. Their institutionalization will help to support the removal of selected highly hazardous synthetic pesticides from national markets and will anchor a culture of continuous regulatory oversight.

This work has been shown to be successful in the past. One example of this work in practice is in Kenya, where CABI has been providing technical support to Kenyan regulators since 2024 to review three active ingredients of concern used in Kenya, namely acrinathrin, profenofos, and hexaconazole, drawing on scientific evidence, residue data and public consultation. In 2025, PCPB decided to revoke all registrations of synthetic pesticides with these active ingredients by December 2026 based on the review findings and a resulting assessment of trade, human health and environmental risks. This outcome underscores how structured, robust review systems can lead to **decisive, evidence-based regulatory action**.

Establishing national pesticide residue monitoring frameworks

Another major milestone was reached with Kenya's National Pesticide Residue Monitoring Framework. PlantwisePlus played a key role in supporting the establishment of this monitoring framework in 2024, co-ordinating and facilitating collaboration between PCPB, export certification agencies, laboratories, producer organizations, and export associations, with the objective of building a **strong and sustainable monitoring system** that gathers, consolidates, and shares data on pesticide residues in both domestic and export value chains.

In 2025, the draft framework was piloted across various counties, covering domestic and export crops (tomatoes, kales and French beans). The aim was to test key aspects of the draft framework, including co-ordination amongst stakeholders, sample collection, laboratory analysis, data sharing, reporting mechanisms, and budgeting. The pilot involved government agencies and private sector partners such as PCPB, Kenya Plant Health Inspectorate Services (KEPHIS), the Agriculture and Food Authority-Horticultural Crops Directorate (AFA-HCD), the Ministry of Health, aak-GROW (CropLife Kenya), Bureau Veritas, the Retail Trade Association of Kenya (RETRAK), and farmers' associations (such as Fresh Produce Exporters Association of Kenya (FPEAK)), and the Fresh Produce Consortium (FPC). The participating agencies contributed to the budget for implementing the exercise. The pilot confirmed that the processes under the framework can be implemented effectively but also highlighted areas for improvement. The participating agencies and others, including the International Biocontrol Manufacturers' Association (IBMA), partnered with the Institute of Plant Protection at the Chinese Academy of Agricultural Sciences to address key operational needs and to deliver technical training. Additional standard operating procedures were developed under complementary funding from Trademark Africa, an organization that seeks to facilitate international trade within and from the African continent. The pilot validation workshop highlighted the **essential role of counties** in working directly with farmers to gather data, offer guidance, and promote food safety practices. Counties were also acknowledged as playing a key role in educating farmers and making sure corrective actions are taken when pesticide use creates risks.

The next step will be to obtain ministerial endorsement for a roll-out across all 47 counties. This will position Kenya to institutionalize a modern, co-ordinated national residue monitoring system that will strengthen food safety, facilitate trade by reducing barriers, and reinforce confidence in Kenyan produce.

Strengthening national co-ordination platforms for pesticide risk reduction

PlantwisePlus supported the establishment and strengthening of **multi-sectoral co-ordination groups** in Bangladesh, Pakistan and Sri Lanka, ensuring that pesticide risk reduction activities respond to national priorities and are validated by the relevant institutions. These platforms bring together regulators, exporters, producer associations, and the crop protection industry to identify synthetic pesticides of concern and jointly design mitigation measures.

Bangladesh's **Bioprotection National Network**, created under the Bangladesh National Bioprotection Forum, is a notable example. It was established to accelerate local production, regulation, and uptake of biopesticides and biological control agents. Meanwhile, following three years of strong, PlantwisePlus-supported collaboration between CABI, the Pakistan Agricultural Research Council (PARC), the United States Department of Agriculture (USDA) and the United States Agency for International Development (USAID), Pakistan launched **standardized requirements for biopesticide registration**, increasing regulatory consistency and reducing administrative burdens for innovators. This will promote the uptake of lower-risk and more environmentally friendly biopesticides to further improve the quality of food produced and to mitigate trade-related issues, including maximum residue levels (MRLs) affecting produce.

In Ghana, ongoing dialogue with the Environmental Protection Agency led to commitments to streamline registration steps for biopesticides, which will **improve the availability** of lower-risk plant protection solutions. Finally, in Zambia, CABI initiated dialogue with the pesticide regulator (Zambia Environmental Management Agency) on the domestic implementation of new Southern African Development Community guidelines for biopesticide registration, paving the way for **regional harmonization**.

Training and mass communication

A key objective for the programme is to enable **practical change at farm level**, as well as at policy level. In 2025 PlantwisePlus continued to contribute to the promotion and implementation of pesticide risk reduction practices and products in the field. More than 26,500 stakeholders across Bangladesh, Ghana, Kenya, Pakistan, Sri Lanka and Uganda were trained on pesticide risk reduction in practice in 2025, covering the full pesticide lifecycle, from appropriate use of synthetic products to understanding and managing residue risks and understanding alternative approaches. Trainees included farmers, agro-input dealers, extension officers, crop protection industry staff, regulators, spray service providers, aggregators, traders, journalists, and laboratory personnel, reflecting the programme's whole of system approach to capacity building.

Complementing this on-the-job training, successful mass extension and **SBC campaign** approaches continued to be delivered across PlantwisePlus focus countries, reaching well over 3 million farmers through country-specific mass messaging via radio, field days, voice messages, expos, and community forums. 2025 marked the conclusion of PlantwisePlus investment in the SBC campaign approach in two countries, Kenya and Pakistan. The pilot assessment of Pakistan's campaign found that the SBC campaign was **highly relevant, timely, and well received** by its target audiences. Participants spoke positively of the structured and useful information that was delivered through innovative and engaging approaches. In their feedback, farmers reported improved awareness of pesticide risks, IPM measures, and safer disposal behaviours.

Kenyan data from the assessment of the *Ukulima True* campaign showed clear links between SBC campaign exposure and improved pesticide practices, increased uptake of IPM, and greater willingness to pay for biopesticides – demonstrating that well-designed two-way communication and engagement can not only shift knowledge but also change behaviour. Further confirming the value of the SBC approach, the Ministry of Agriculture proposed integrating the approach and the plant doctor initiative into the Nakuru County Extension Policy.

The assessments of the Pakistan and Keyna SBC campaigns provide **valuable lessons for replication** of the SBC approach in Bangladesh, Sri Lanka, Uganda and Ghana.

From policy to practice: ensuring access to lower-risk plant protection products

Since 2023, CABI has worked alongside national and regional partners to develop pesticide risk reduction (PRR) policies and promote their implementation, bridging policy-level change and farm-level impact.

Number of PRR policy-level strategies developed with partners

11 in 2025

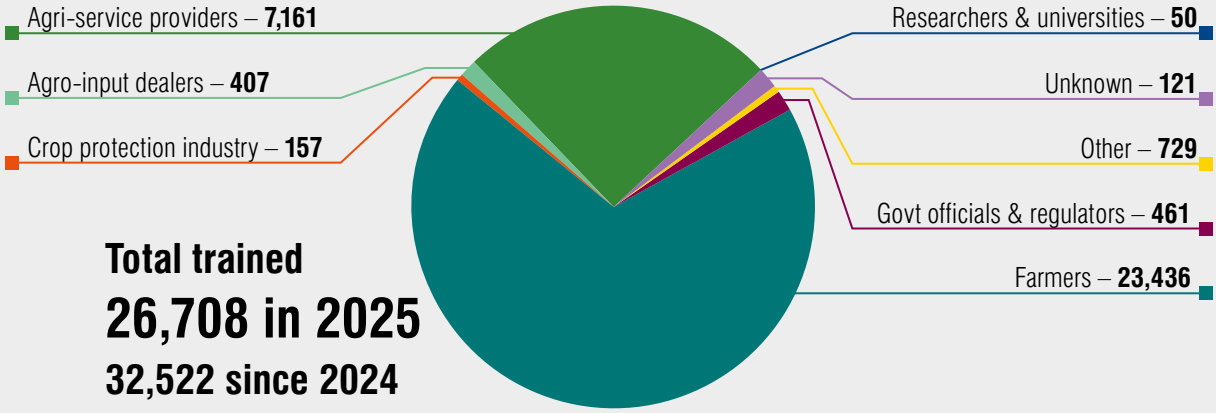
16 since 2024

8 in Kenya

1 in Pakistan

2 in Uganda

Guided by PRR strategies, PlantwisePlus trained farmers, regulators, industry professionals, and researchers across Bangladesh, Ghana, Pakistan, and Kenya on pesticide risk reduction, covering the full pesticide lifecycle.



Total trained

26,708 in 2025

32,522 since 2024

In Ghana, Pakistan and Kenya, these trainings and other social and behaviour change actions are guiding farmers through a step-by-step journey towards adopting safer, more sustainable practices.

Farmers that understand pesticide risks and alternatives

861K in 2025

2.8M since 2024

IPM practices adopted by farmers (e.g. crop rotation, mulching)

8 in 2025

17 since 2024

Lower-risk products adopted by farmers (e.g. traps, biocontrol agents)

7 in 2025

15 since 2024

Safer pesticide application practices and protective equipment adopted by farmers (e.g. face masks, reducing spray drift)

7 in 2025

87 since 2024

Partnering with the private sector to improve access to lower-risk alternatives

Private sector collaboration played an increasingly important role in expanding farmers' access to bioprotection products in 2025. In Bangladesh, the newly established Biopesticide Forum enabled structured engagement with manufacturers, such as Ispahani and Russell IPM. In Ghana, partnerships helped deliver field demonstrations of *Bacillus thuringiensis* (Bt) products and neem-based solutions in major tomato-producing districts, giving farmers first-hand experience of effective lower-risk alternatives.

Kenya advanced an innovative hub model, created in collaboration with Koppert and the Cereal Growers Association, to bring together CABI tools and services under a single platform promoting lower-risk plant protection amongst farmers. Learnings pointed to increased awareness of and demand for bioprotection products. These partnerships ensured that knowledge delivered through training and SBC campaigns was backed by practical access to products, closing a critical gap between awareness and adoption.

Classical biological control of invasive species

Institutionalization of the Parthenium biological control programme in Pakistan

One of the most significant developments in PlantwisePlus-led classical biological control activities during 2025 was the handing over of Pakistan's Parthenium weed programme to national partners. After releasing more than 25,000 herbivorous weevils that feed on Parthenium, and after confirming their establishment in three provinces, PlantwisePlus convened a **structured handover process**. CABI-led training workshops and capacity-building efforts ensured that national partners, including the Pakistan Agricultural Research Council (PARC) and the Department of Plant Protection, are in a strong position to assume full responsibility for ongoing implementation. CABI will remain available to support future enhancements.

Building regulatory foundations in Zambia

In Zambia, programme efforts to introduce a natural enemy of FAW and another natural enemy of tomato pinworm over the past two years have highlighted that Zambia's existing legislation is not designed to approve and regulate the introduction of classical biological control agents. Rather than proceed under unclear regulatory conditions, PlantwisePlus pivoted to engaging with national agencies on the development of **national guidelines for classical biological control**. Following several meetings with the Zambian authorities and various national organizations, a focused workshop was co-organized by the Zambia Environmental Management Agency (ZEMA) and CABI to identify regulatory challenges, gaps and opportunities. The workshop hosted various organizations, including the Zambia Agriculture Research Institute (ZARI), the University of Zambia, CropLife, the German Corporation for International Cooperation (GIZ) and the International Centre of Insect Physiology and Ecology (ICIPE). A key outcome of the workshop was the decision that CABI should support ZEMA and the Plant Quarantine and Phytosanitary Service (PQPS) to draft national guidelines for classical biological control in 2026. This foundational work will enable future biological control introductions to proceed in a well-structured manner and will strengthen Zambia's capacity to address introduced pest outbreaks in the years ahead. Partners in Malawi have shown an interest in using the guidelines to be developed in Zambia as a model for similar guidelines for Malawi, demonstrating how policy change in one country can have a beneficial snowball effect that supports regional regulatory capacity.

Impact of classical biological control of papaya mealybug in Kenya and Uganda

The classical biological control of papaya mealybug has become one of the most visible success stories under PlantwisePlus. In Kenya, a natural enemy of mealybug, a tiny parasitic wasp, has been introduced and has now spread across the country, with releases on over 440 additional farms in 2025 and establishment confirmed in at least 17 counties. Wherever it takes hold, farmers report rapid reductions in mealybug infestations and strong recovery of papaya trees.

A socioeconomic study conducted in Kenya in 2025 involving 405 farmers across four counties demonstrated the impact of this intervention. Compared with a 2019 baseline, the introduction of the biological control agent **increased yields** by 19%, **sales** by 18%, **income** by 57%, **and production diversity** by 14%. These figures likely underestimate long-term benefits, as many farms had only just received the biological control agent at the time of the study. These positive results complement findings in 2024 that papaya farmers had reduced their reliance on insecticides as a result of the intervention. This led to increases in local biodiversity, demonstrating that biological control can contribute explicitly to ecosystem health.[2]

PlantwisePlus has also delivered extensive capacity strengthening to support the positive impact of this nature-based solution. In 2025 alone, CABI sensitized 494 farmers and 54 agricultural officers in classical biological control of papaya mealybug, covering every county where releases of the biological control agent took place. Farmers learned how to identify mealybugs, and the papaya mealybug specifically, how the natural enemy operates, and how to support its establishment and spread by using field reservoirs and reducing the use of synthetic pesticides. This was well received in the different counties, with some farmers in Makueni County even forming groups to champion awareness of pest risks and new farming methods. Training emphasized that management strategies should follow the EPESAC approach (effective, practical, economical, safe to humans and the environment, easily available, and culturally acceptable). Another benefit of the training is that agricultural officers can use these skills in other biodiversity conservation projects. This work builds on earlier efforts, bringing total reach since 2021 to more than 4,400 farmers, 500 agricultural officers and 37 KEPHIS crop inspectors, as well as national researchers and students who partnered closely with CABI throughout the project.[3]

These activities and success stories will enable a smooth transition to national leadership: after some final releases in early 2026, CABI will hand over full responsibility for ongoing activities to KALRO.

Progress in Uganda in 2025 further demonstrated the model's potential for **scalability** of the papaya mealybug control approach. There, the biological control project is almost entirely conducted by the National Agricultural Research Organisation (NARO) and the National Crops Resources Research Institute, with PlantwisePlus providing only technical backstopping and supervision. A fully functional production unit now supplies the parasitic wasps for nationwide releases, which expanded to 12 new districts in 2025. Monitoring shows that the agent is spreading rapidly, as in Kenya, both naturally and through farmer-led distribution, and is suppressing mealybug populations while **boosting fruit production**. Outreach activities during community events and national celebrations have helped embed biological control within broader agricultural education efforts.

Both countries will continue releases and monitoring, and will conduct further socioeconomic assessments in 2026. Together, they provide an excellent example of the sustainability of classical biological control as a **publicly owned and community-driven solution** to the formerly devastating papaya mealybug problem.

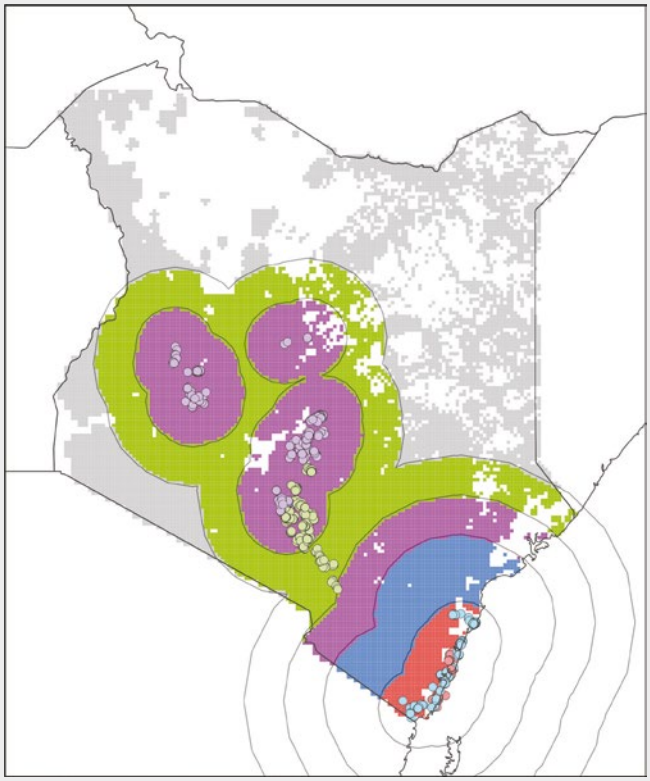
2. Miller, S. and Constantine, K. (2024) Biological control for papaya mealybug: lessons learnt from Kenya. CABI. **https://www.cabi.org/cabi-publications/biological control-for-papaya-mealybug-lessons-learnt-from-kenya/**

3. Sensitization is the term used by CABI to describe information-sharing sessions with stakeholders about classical biological control, and how it works and has worked elsewhere, and which encourage them to reduce their use of pesticides. Training is the term used for a full-day workshop where these topics are presented and discussed in more depth.

Kenya's success with papaya mealybug biological control

Between 2022 and 2024, PlantwisePlus enabled the release of the natural enemy *Acerophagus papayae* across Kenyan counties to combat the invasive papaya mealybug, successfully reducing pest populations and improving livelihoods for local farmers. New data from 2025 shows the biocontrol agent is spreading quickly.

Estimated spread of the biocontrol agent



- YEAR 1 (2022)
- YEAR 2 (2023)
- YEAR 3 (2024)
- YEAR 4 (2025)
- Papaya growing area (not yet reached)
- Release site

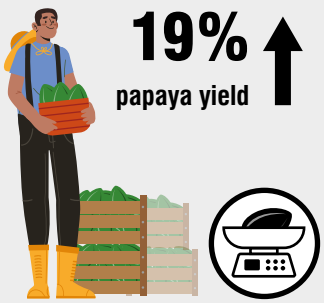
Post-release monitoring found the biocontrol agent up to 100 km from the initial release sites three years after release.

Acerophagus papayae

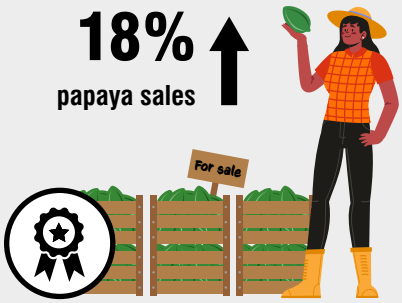
4,419
farmers reached through training, releases, and awareness activities (2021–2025)

4,731 ha
estimated area of papaya under classical biocontrol in Kenya

Transforming livelihoods through biocontrol



19% ↑
papaya yield



18% ↑
papaya sales

57% ↑
income

Data from a socio-economic study of 405 papaya growers across four Kenyan counties (2022–2024), compared to a 2019 baseline before the biological control intervention.

Augmentative biological control

Government ownership accelerating progress in Asia

PlantwisePlus's work on augmentative biological control in Pakistan saw exceptional **government commitment** in 2025. A sustainability workshop helped prepare provincial institutions for upcoming handovers. Moreover, Punjab approved plans for a new *Trichogramma* rearing facility, and Khyber Pakhtunkhwa committed funding for six additional production sites, designating Mardan as a centre of excellence. These initiatives demonstrate that government ownership is central to scaling and sustaining augmentative biological control solutions.

> "Extension workers visited our fields and provided cards containing eggs. These were placed on the eastern side of the field and stapled under the leaves. This approach produced very good results. Previously, we relied on spraying, but the cards proved effective."

Akbar Ali Khan, a farmer from Mardan, Pakistan, who adopted biological pest control methods through PlantwisePlus TRF activities.

Following a year of slow progress in 2024 due to national elections and governmental change, considerable progress was made in Bangladesh in 2025. Bangladesh advanced biological control work, with strong support from the Bangladesh Agricultural Research Institute, including the official opening of a *Trichogramma* rearing facility at the Regional Agricultural Research Station in Rangpur. **National media coverage** helped raise public awareness, while targeted capacity building for 20 extension staff, supported by the World Bank Program on Agricultural and Rural Transformation for Nutrition, Entrepreneurship, and Resilience (PARTNER), ensured that technical staff were fully equipped to run the facility.

In Sri Lanka, a new **formal biological control agreement** between the Department of Agriculture and CABI set the stage for long-term collaboration. Infrastructure upgrades at the Horticultural Crop Research and Development Institute expanded the country's capacity to produce biological control agents, and a national training programme deepened technical expertise among 31 participants, including 20 women. These developments position Sri Lanka to sustainably scale government-led production of biological control agents in the coming years.

Building confidence in biological controls through visible evidence

Field demonstrations, where feasible, are a powerful mechanism for encouraging farmer adoption of lower-risk tools. These efforts are grounded in the principle that farmers are more likely to adopt lower-risk alternatives when they understand how they work, see results in the field, and have reliable access to the products.

In Ghana, trials conducted in 2025 helped farmers observe first-hand the compatibility and effectiveness of a predatory mirid bug against tomato leaf miner used alongside neem and Bt-based products. Meanwhile, at sites in Kenya, Uganda and Ghana, PlantwisePlus undertook several outreach and awareness initiatives to educate farmers, extension workers and the general public on the use of classical biological control against the papaya mealybug and on pest management in general. The visual impact of biological control, as farmers see their own crops recover, continued to be one of the strongest motivators for uptake.

In Zambia, farmer engagement extended far beyond training: instead, a deeply participatory approach was applied that combined field trials, community outreach, youth leadership, and gender-inclusive methods. Trials on a *Metarhizium* fungal strain took place across four regions and off-season sites, while 1,417 farmers were reached through demo plots and field days, helping refine application guidance and attracting new private sector partnerships with Koppert SA and Zamseed. The programme also invested in **youth participation**, training 20 youth champions who transferred knowledge to 81 youth farmers, forming four co-operatives, and later expanding training to 60 youth, with 60% women's representation. To **challenge gender norms**, a participatory video process involving 17 women farmers enabled them to document challenges and propose solutions, ensuring their perspectives reached district-level decision makers and embedding community-owned approaches into FAW management.

Farmer advisory

Smallholder farmers in low- and lower middle-income countries often lack access to accurate, timely and science-based plant health information. This information gap constrains their productivity, profitability and resilience. PlantwisePlus addresses this gap by **strengthening agricultural advisory systems** and **expanding access** to trusted crop health services. It builds the capacity of frontline plant health workers in rural communities, equipping extension staff, agro-input dealers, and lead farmers with practical, gender equitable tools and training, enabling them to offer timely, science-based guidance to farmers.

By engaging both **public and private sector providers**, the programme creates a broader, more responsive network of plant health advisors. These trained providers promote IPM and sustainable practices, delivering timely, locally relevant guidance that helps farmers reduce losses, lower input costs, and increase yields.

PlantwisePlus also stimulates local enterprise by **supporting agribusinesses**, particularly those led by women and young people, to provide plant health services, generating income while improving community-level support.

Digital decision support tools amplify this impact, delivering context-specific, climate-smart information through data-driven technologies and responsible use of artificial intelligence (AI). Together, these approaches extend advisory coverage, strengthen resilience, and enable smallholder farmers to manage their crops more sustainably and profitably.

Strengthening advisory tools and content to improve decision-making

PlantwisePlus Factsheet Library

One of the most visible improvements for CABI digital tool users in 2025 was the **relaunch** of the PlantwisePlus Factsheet Library app. Along with significant improvements to reduce maintenance costs, the relaunch also improved workflows and accessibility, and provided new language support. Feedback from advisors also led to changes that streamlined the process of getting to the desired information. Users are now able to find content more quickly and the data burden has been reduced, resolving what had been a significant problem in countries with limited internet access. Language support was introduced in Nepali, and CABI also led an exploration of different possible audio formats, to broaden access for users facing literacy barriers.

Users of the PlantwisePlus digital tools had also been asking for more support in diagnosing crop problems. CABI partnered with an existing private-sector diagnostic service, Plantix, to make **automated image-based diagnosis** available within the PlantwisePlus Factsheet Library app. Farmers and extension workers can now receive quick indications of likely pest or disease issues and move straight from a suggested diagnosis to practical, locally relevant PlantwisePlus content. The diagnostic feature does require internet connectivity, which remains a challenge across and within programme countries. However, CABI remains committed to ensuring as much of the PlantwisePlus content as possible remains fully accessible offline. This balance reflects CABI's ongoing commitment to serving rural users who may not have access to stable, affordable internet access.

PlantwisePlus Knowledge Bank

In 2025, the PlantwisePlus Knowledge Bank continued to grow as a trusted source of actionable information. **More than 1.9 million users** accessed the platform during the year (a 5% increase on 2024), and improvements in navigation, input management (such as more accurate handling of spelling variations) and linking to related content helped readers move more easily between Factsheets for Farmers, Pest Management Decision Guides, photosheets and new climate-smart materials. For many advisors, this means they can spend less time searching and more time providing timely support to farmers.

A key step forward was the integration of bioprotection product information from CABI's BioProtection Portal into Pest Management Decision Guides. Users now see up-to-date overviews of registered bioprotection products that are legally available and safe to use. Similarly, updates drawn from CABI's pesticide registration work ensure that synthetic pesticides that are no longer legally available are automatically removed from PlantwisePlus content: users no longer see recommendations that could be outdated or out of line with national regulations. This makes sustainable pest management recommendations more **trustworthy and practical**, building the confidence of extension workers in knowing which products they can recommend.

User demand for **climate-informed guidance** continued to grow in 2024. PlantwisePlus responded to this demand by working with country partners in Nepal, Sri Lanka, Pakistan and in PlantwisePlus countries in Latin America to incorporate climate-smart agriculture principles into Pest Management Decision Guides and by publishing a new collection of climate-smart agriculture factsheets on drought, storms, excessive rainfall, heat stress and practical methods such as mulching and reduced tillage. Partners responded very positively to the results, and discussions highlighted how the main challenge in updating or expanding this work will be the limited availability of information on how climate change is already altering pest pressures and crop suitability. More information regarding soil health was another common request from users. To meet this need quickly and at scale, CABI adapted material from existing CABI Academy courses into 31 new soil health factsheets, offering farmers and advisors actionable guidance while also signposting the more comprehensive courses available through the CABI Academy.

Importantly, issues identified in 2024 regarding user data collection were resolved with a transition to a new web analytics tool, Matomo. Unlike Google Analytics, Matomo Analytics is self-hosted, guaranteeing that data remain secure in CABI's hands. Matomo has replaced Google Analytics across all PlantwisePlus digital tools and learning products, enabling seamless data integration and facilitating data validation and analysis to ensure data accuracy.

CABI BioProtection Portal

In 2025, the CABI BioProtection Portal saw substantial growth, surpassing its user target, with over 280,000 users and a 175% rise in monthly visits, driven by users finding the Portal through online searches (organic traffic) and successful multilingual campaigns. Its visibility increased through winning the **Gold Stevie Award** for Sustainability Initiative of the Year in Europe (part of the 22nd Annual International Business Awards), representation at major international events, the launch of a well-received success stories area with global case studies, expanded content outputs, and new country additions including Belgium, Trinidad and Tobago, and Switzerland, all of which strengthened the Portal's role as a leading global resource for bioprotection.

CABI Academy

The CABI Academy saw significant growth in 2025. With more than 16,500 new users and almost 20,000 course enrolments, the Academy is rapidly becoming a key learning platform for the next generation of agricultural advisors reached by PlantwisePlus. More than 2,100 users completed courses in their native languages in 2025, thanks to translations into French, Spanish, Bengali, Tamil and Sinhala. This directly addresses a barrier raised in user surveys, especially among learners in South Asia and Latin America. 32% of those enrolled are achieving a certificate. Improved navigation, better mobile responsiveness and simplified account creation further support users who rely primarily on a phone to access the Academy (currently a majority of Academy learners). Most importantly, the CABI Academy continued to receive extremely positive feedback during the year. The average score across all courses was 4.43 / 5.0, and 78% of learners reported feeling **more confident** in diagnosing and managing crop problems after completing their course, whilst 80% said they felt **ready to apply their new skills** in the field.

Financial sustainability of digital solutions

Underlying all of these developments is a broader shift towards sustainability and diversification. CABI is advancing these efforts through diversification of revenue streams, content licensing agreements, API development, and exploration of new commercial concepts.

To ensure that digital tools and learning products remain viable beyond donor funding, PlantwisePlus introduced a **payment mechanism** for users in higher-income countries for both the Knowledge Bank and the CABI Academy. In the Knowledge Bank, this involves restricting access to Technical Factsheets so that only PlantwisePlus countries and over 70 additional low- and lower middle-income countries can access these factsheets for free. All other users are invited to purchase access to full datasheets through CABI's Digital Library. This functionality was released at the end of 2025, and initial sales were made, showing the potential for this to generate income. The same set of low- and lower middle-income countries also have free access to CABI Academy courses, with learners in middle- to higher-income countries invited to purchase access to courses since October 2025.

While revenue so far is modest, adopting this mechanism has been an important step towards socializing users on the value of CABI content. With an established system in place, the door is open for promoting paid materials and courses. Several organizations have already approached CABI about bespoke training or co-branding opportunities, demonstrating **early market interest**. Three non-PlantwisePlus projects (funded by the Australian Centre for International Agricultural Research (ACIAR), the United Nations Environment Programme's Financing Agrochemical Reduction and Management programme, and Juno) contributed 19% of the CABI Academy's budget in 2025.

Other commercial concepts applied in 2025 included updates to the CABI BioProtection Portal **commercialization strategy**, with new pricing models for data sales and expertise. The Portal also continued to diversify its funding base, with four new paying members (PJ Margo, IPL Biological, Biofactor, DunhamTrimmer). With broadening adoption and sponsorship by private-sector partners, including biological control companies, this shows how PlantwisePlus-aligned tools can attract sustained commercial investment. CABI's PULSE analytics are also showing potential for commercial applications. PULSE combines data from across CABI's digital tools to provide insights for partners on which pests are being searched most frequently, what content farmers are accessing, and how trends vary over time, not limited to PlantwisePlus. This year, PULSE analytics contributed to identifying priority pests in Kenya and Ghana. Custom analytics reports were produced and shared with CABI's Global Burden of Crop Loss project to test whether user analytics data on crop and pest views can be used to support the prioritization of the most impactful pests for further research. These reports were found to be useful, despite limitations in geographic coverage. In 2026, CABI will incorporate high-level user analytics from the CABI BioProtection Portal into PULSE, to test how these data combinations could benefit PlantwisePlus stakeholders and to explore whether these enhanced reports could form a commercial offering.

Promotion of decision support tools and e-learning products

Across the programme countries, digital tools supported farmers and agricultural service providers to make more informed and reliable decisions, building the enabling conditions for lower-risk pesticide use, accelerated adoption of IPM, and more equitable access to plant health knowledge. In 2025, PlantwisePlus investment in digital advisory tools and learning products pivoted from promoting the tools through a wide range of approaches to **embedding their use** within national agricultural systems, partner platforms and institutional workflows.

Digital reach and usage grew substantially. Overall, more than **2.3 million engaged users** were logged across the digital tools and CABI Academy offerings during 2025. As well as being a significant increase on the 2024 figure of around 1.3 million, activity patterns showed high return user rates among extension officers and service providers who rely on PlantwisePlus as part of their daily decision-making. Strong ownership by national partners helped drive this trend. In Costa Rica, Ghana, India and Sri Lanka, PlantwisePlus tools and CABI Academy learning products were integrated into formal training curricula and official training mandates. In many cases, partners are also providing co-financing. Embedding these resources within national extension systems and professional development programmes supports sustained use beyond direct project support. This has contributed to more than 1,181,000 engaged users of the tools in PlantwisePlus countries in 2025, plus another 1,143,000 elsewhere in the world.

Intermediary-led dissemination remained one of the strongest drivers of reach and sustained use in 2025. Through training and targeted outreach, the programme directly engaged 117,502 agricultural service providers (including extension officers, spray service providers, plant doctors, IPM facilitators, and agro-input dealers), researchers and students. This design ensured that users encountering the Factsheet Library app, Crop Sprayer App, the CABI BioProtection Portal, the Knowledge Bank and the CABI Academy used them within real decision events, reinforcing relevance, trust and re-use. Agri-service providers alone (excluding students and researchers) logged 1.02 million engaged sessions across the platforms, reflecting the potential for scaling among advisory intermediaries who increasingly embed digital tools within their workflow. In Bangladesh, for example, tool utilization rose sharply throughout the year, with major increases driven by 12 ‘digital champions’ conducting intensive grassroots promotion across three regions.

Digital extension campaigns also proved especially successful in contexts where real-time pest pressure and advisory demand were high. By targeting specific pest–crop combinations, these campaigns ensured that tools were used when farmers needed them most. In Ghana, digital extension campaigns reached over 10,600 extension officers, agro-input dealers, farmers and students, providing hands-on exposure to digital tools and reinforcing their use as practical decision support resources. In Bolivia, digital extension campaigns focused on practical, hands-on training for students, farmers and extension staff, directly engaging approximately 3,500 individuals and establishing the foundations for normalizing digital tool use within advisory workflows and educational settings. Across countries, digital extension campaigns demonstrated that the strongest evidence of real-world, behavioural impact occurs when three conditions are met: (1) tools are aligned with immediate decision needs, (2) intermediaries reinforce usage, and (3) engagement is repeated over time.

Closing the gender gap in digital advisory

Women continue to play a central role in agricultural labour across PlantwisePlus countries yet remain disproportionately excluded from digital advisory due to limited device access, weaker digital skills and lack of confidence in digital approaches. CABI has taken several steps to close the gender gap in digital advisory, including aligning training programmes (including use of digital skills resources developed through the CABI Academy) with the UNESCO Global Framework on Digital Literacy, and promoting explicit engagement by and for women in digital promotion events. Indeed, **women accounted for 49% of participants** in PlantwisePlus direct digital engagement activities in 2025. This shows a strong outcome of the programme’s gender-responsive design, facilitation approach and deliberate strategies to ensure equitable access.

PlantwisePlus implemented targeted **digital literacy initiatives** in 2025, with a particular focus on women farmers, extension officers, and IPM facilitators. Thus, rather than focusing solely on technical skills, the trainings addressed a broader set of competencies, including:

- navigating digital interfaces confidently
- identifying and using trusted sources of agricultural information
- applying digital tools safely and responsibly in advisory contexts

Instead of applying a single model across the board, PlantwisePlus adapted its gender-responsive digital literacy approach to country-specific contexts, being responsive to the needs, capacities and institutional arrangements of each. Across Nepal, Bangladesh, Ghana, Pakistan and Uganda, 6,440 individuals were trained as master trainers in digital skills. The programme team ensured that 80% of the people trained were women. These trainers cascaded their skills to thousands more through extension networks and peer-learning groups. In Bangladesh, women facilitators reported major increases in their ability to deliver advice. In Nepal, more than 350 women gained practical digital advisory skills, and follow-up assessments showed a 67% increase in confidence among participants using PlantwisePlus tools. Evidence gathered three months after trainings in Nepal showed signs of a longer-term impact on women's empowerment: women farmers increasingly initiated discussions on accessing digital advisory information and began negotiating shared use of mobile devices within households. This is an encouraging indicator of the potential impact of digital literacy work.

Advisors in Kenya described how the CABI Academy training gave them the confidence to conduct independent field visits for the first time. In Rwanda, a researcher shared how the skills from the crop pest management course enabled him to support rural farmers more effectively and to increase their yields. Students in Nepal are using CABI Academy material to strengthen their diagnostic abilities before entering professional roles.

Digital tools driving reduced pesticide use in India

A notable achievement in 2025 was the evidence linking digital advisory tool use to measurable improvements in pesticide-use behaviour.

In India, CABI collaborated with local partners to conduct an awareness raising digital extension campaign, which showed how the PlantwisePlus digital tools (CABI BioProtection Portal, the Crop Sprayer app and the Factsheet Library app) can support the sustainable management of the chilli black thrips pest and reduce the reliance on high-risk synthetic pesticides.

An impact assessment in which nearly 1,000 Indian farmers were interviewed after the digital extension campaign found that those who used the tools (i) adopted 11% more IPM practices than non-users, (ii) were 55% more likely to adopt biopesticides, and (iii) reduced how often and how much they used hazardous pesticides. Importantly, their livelihoods also improved. They reported an average 23% increase in profit compared to those who did not use the digital tools.

> "Before CABI Academy, I used to avoid fieldwork because I lacked confidence. Now, I enjoy visiting farmers, diagnosing problems firsthand, and offering timely, science-based advice."
>
> Mercy Akinyi Ogonyo, Crop Health Scientist, Kenya, who uses the CABI Academy online courses to build her advisory skills

This success story demonstrates the **power of digital innovation in agriculture** and bolsters the programme's decision to invest heavily in promoting these tools as a means of promoting sustainable agriculture and empowering farmers, advisors and other users to make better informed decisions.

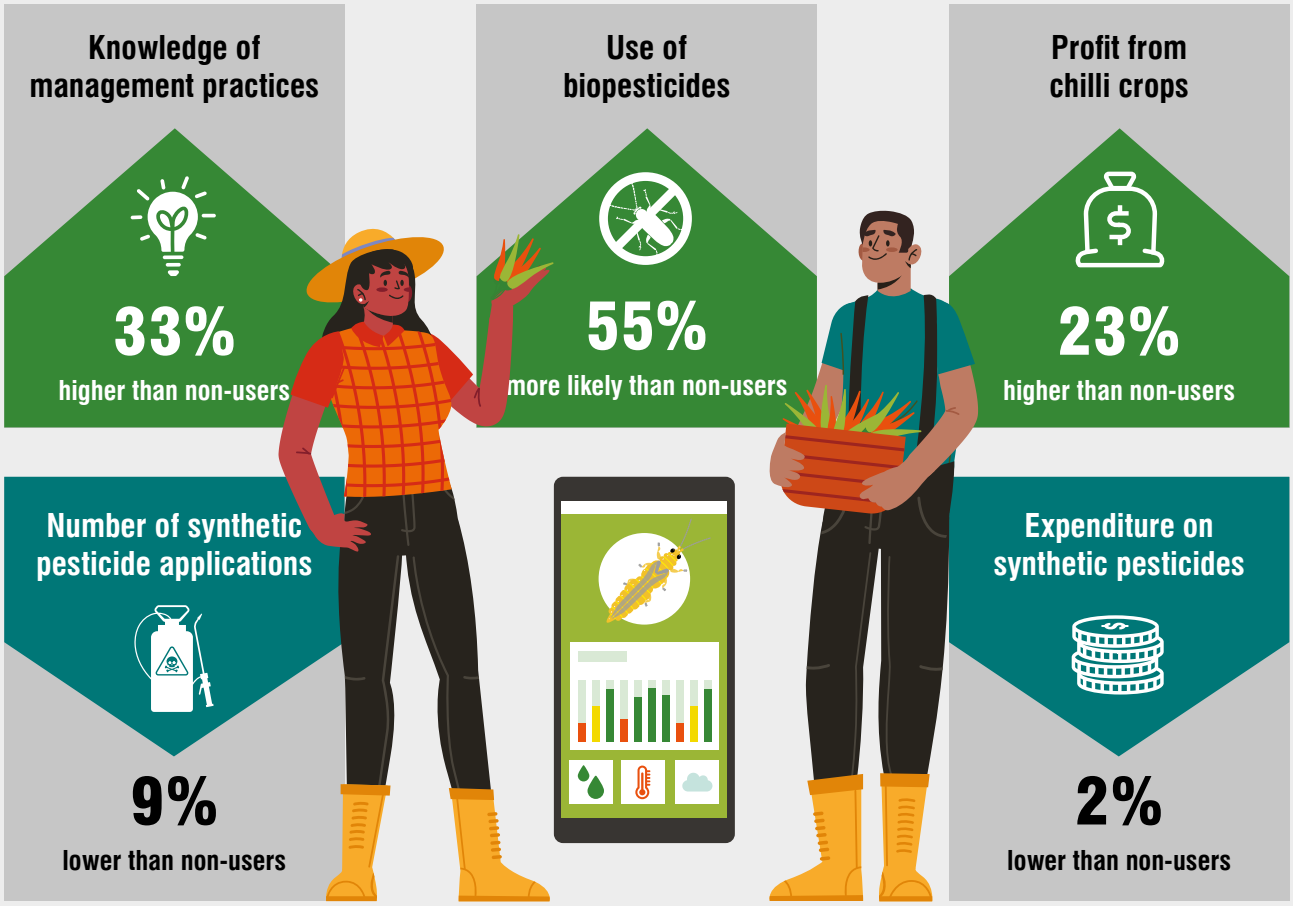
Strengthening policy alignment and institutional ownership

Institutionalization efforts advanced significantly in 2025. Several countries integrated PlantwisePlus digital tools into national extension platforms, training curricula in universities and technical and vocational education and training (TVET) institutions, government-led IPM programmes and national e-extension strategies. Examples include Ghana's adoption of PlantwisePlus tools by extension workers across all 16 of its regions, Sri Lanka's integration of these tools into official plant doctor training, and Pakistan's provincial-level adoption

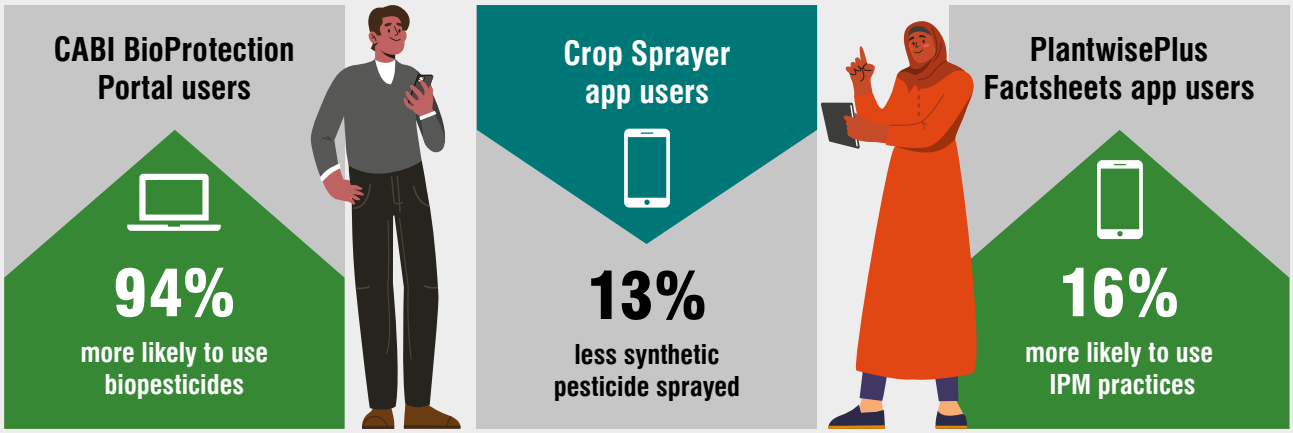
Promoting sustainable pest management practices through digital tools

PlantwisePlus introduced farmers in three major chilli-producing states in India to a suite of CABI digital tools – the **CABI BioProtection Portal**, **Crop Sprayer app**, and **PlantwisePlus Factsheets app** – to help them manage the invasive **chilli black thrips** (*Thrips parvispinus*).

Impact of use of multiple digital decision support tools



Most farmers use at least two tools simultaneously leading to a combined impact. However, the tools target different actions leading to broader benefits as part of an IPM approach.



Data: Survey data of 999 chilli farmers in Andhra Pradesh, Karnataka and Tamil Nadu, 457 tool users; 542 non-users. (Tambo *et al*., 2025)

of gender-focused digital literacy trainings. A major achievement during the year was the integration of CABI Academy courses in the Indian National Institute of Plant Health Management's formal curriculum, including through co-certification. For learners, these integrations mean their PlantwisePlus training now counts towards recognized qualifications. For institutions, it offers a reliable source of high-quality, up-to-date teaching material that they do not need to maintain themselves. This kind of embedding marks an important shift, as PlantwisePlus content becomes part of national education systems.

These growing cases of **national ownership**, with governments contributing financial and in-kind resources, adopting tools independently, and formalizing collaboration through agreements, reflect the alignment of the PlantwisePlus digital tools and learning products with policy direction. These successes mark a crucial step towards sustainability and long-term continuity of digital advisory services.

Building plant health expertise in local areas

Scaling and sustaining IPM adoption through the plant doctor approach

The plant doctor approach supports plant health systems across the programme countries, strengthening national capacity to deliver high-quality, climate-smart IPM advice through complementary outreach channels. Plant doctors reach farmers through clinics, field visits, field days, digital platforms such as WhatsApp and Telegram, and mass communication channels including radio and social media. The approach prioritizes gender-responsive advisory services, contributing to increased participation, access, and decision-making influence for women in agriculture.

In 2025, PlantwisePlus **strengthened national plant health systems** across all programme countries through expanded plant clinic operations, improved diagnostic and advisory capacity, and increased national ownership. Formal memoranda of understanding (MoUs) were signed with government agencies and partner institutions, securing commitments to sustained funding, embedding of clinic activities within subnational systems and integration of PlantwisePlus materials into university curricula. Universities in India, Ghana, Kenya, Bolivia and Papua New Guinea were among those who strengthened integration of PlantwisePlus materials through formal partnerships and MoUs. In Ethiopia, Malawi, China and Costa Rica the plant clinic model was formally incorporated into national extension plans, training systems, work programmes and budgets, reinforcing long-term sustainability. Finally, a major milestone was achieved in Nepal, where the government formally institutionalized the plant doctor training curriculum nationwide for standardized and sustainable capacity building of extension staff.

Capacity strengthening further reinforced in-country training delivery. In 2025, over 1,100 plant health personnel were trained in plant doctor modules across 12 countries, while over 3,100 additional stakeholders completed short courses on IPM, biological control, digital advisory tools, gender-responsive service delivery, data management, and monitoring and evaluation. These trainings were largely delivered by national institutions, with CABI providing limited backstopping and occasional refresher support. These efforts boosted human resource capacity and helped address challenges linked to staff turnover and varying digital literacy levels.

Globally, in 2025, plant clinics, plant health rallies, and other **face-to-face outreach** activities reached an estimated 465,277 farmers, expanding access to timely, climate-smart plant health advice at scale. This impact was delivered through 3,367 active plant clinics, supported by a substantially larger cadre of trained plant doctors and other extension staff across 25 programme countries. The strength and maturity of clinic networks vary by country, with some systems firmly institutionalized and others still developing, but collectively they reflect substantial reach and progress towards nationally embedded plant health services.

Pakistan recorded the highest level of clinic activity in 2025, with 108,252 farmers served. Other leading countries included Ghana (71,361), Bangladesh (70,459), Ethiopia (39,230) and Thailand (31,249). Across the remaining 20 programme countries, plant clinics reached one-off tens of thousands of farmers, reflecting widespread implementation and continued service delivery in varied national contexts.

These figures capture only a portion of plant doctors' engagement with farmers. While plant clinic sessions and plant health rallies are systematically recorded, many other advisory interactions, including farm visits, field demonstrations, phone consultations, digital messaging, and social media outreach, are not consistently captured across countries. Reported reach therefore, mainly reflects structured clinic events and rallies, and should be regarded as a conservative estimate of total farmer engagement.

Performance in reaching and engaging **women farmers** varied across countries during the year. In Kenya, Papua New Guinea, Rwanda, Sri Lanka, Thailand and Zambia, women represented more than 50% of farmers reached through clinics and related activities, reflecting progress in ensuring inclusive service delivery. Participation remains heavily male-dominated in Pakistan, Bangladesh and Afghanistan, although gender-focused activities in Pakistan and Bangladesh are working to gradually improve women's access to plant health services.

Driving pesticide risk reduction through agro-input dealer training

Limited public extension services in many countries mean that smallholder farmers often rely on agro-input dealers not only for products, but also for advice on plant health. Yet regulation of agro-input dealers is frequently weak, sometimes with little or no minimum education or training requirements for those storing and selling pesticides. Agro-input dealers also often suffer from significant knowledge gaps in diagnosing crop problems and recommending appropriate management options under an IPM framework. To address this problem, PlantwisePlus strengthens agro-input dealer capacity by working with government partners to help set up, or improve the quality and content of, mandatory training systems. The programme addresses knowledge gaps in plant protection and IPM, with a strong emphasis on the safe handling and responsible use of synthetic pesticides and bioprotection products. Agro-input dealer training materials are co-developed with national partners to ensure they are locally relevant, clear and easy to understand, and aligned with national licensing requirements.

Progress in 2025 was positive, despite implementation challenges related to institutional capacity and regulatory processes in some countries. In Bangladesh, comprehensive **training toolkits** were completed for both new and existing agro-input dealers, including a **pictorial handbook** tailored for less literate participants. The updated plant protection regulations are still awaiting approval; however, the PlantwisePlus contribution to strengthening the mandatory training framework has been **formally recognized** in the Pesticide Rules 2024 (Clause 60, "Mandatory Training of Pesticide Retailers and Wholesale Dealers Licensing System"). This marks a major step forward for Bangladesh, where previously there were no formal training requirements for agro-input dealers. This is critical in a country where pesticide poisoning accounts for approximately 39% of all poisoning cases admitted to hospitals.[4] In 2025, CABI and the Plant Protection Wing of the Department of Agriculture conducted three training of trainers sessions on the toolkit for existing agro-input dealers. Pilot implementation of the national training programme is expected to begin in 2026, laying the foundation for improved pesticide management and more responsible crop protection advisory services nationwide.

In Uganda, PlantwisePlus has worked with MAAIF and Makerere University since 2021 to strengthen the national training framework for agro-input dealers. The need for improved training is clear: a 2021 paper published in *Environmental Health*[5] reported that 70% of agro-input dealers experienced health-related effects within 24 hours of handling pesticides. Addressing these risks is essential not only to protect the retailers but also to improve the quality and safety of the advice provided to farmers. A key 2025 milestone was the development of the **Lower-Risk Plant Protection Products (LRPPP) training toolkit**. During this process, it became evident that the existing Pesticide Safe Use Course lacked a formal schedule and standardized training materials. At MAAIF's request, CABI supported the formalization of the full five-day curriculum, developed through a series of technical working group meetings and workshops with MAAIF and Makerere University. Finally, to support implementation, two pilot trainings were conducted in Mukono for the certification of new agro-input dealers. A follow-up survey will be conducted in 2026 to assess the longer-term impact of these interventions using a 'mystery shopper' approach. With the foundational systems now in place, the programme's active engagement on this output in Uganda is expected to draw to a close, creating an opportunity to apply lessons learned and adapt the approach in other countries.

Scaling paid agricultural services for inclusive rural employment

Strengthening private agricultural service providers directly addresses persistent gaps in public extension systems. By equipping **local entrepreneurs** to deliver high-quality advisory services and access to inputs, PlantwisePlus expands smallholder farmers' access to trusted advice while creating sustainable income opportunities for rural youth, women and men.

4. Dewan, G. (2014) Analysis of Recent Situation of Pesticide Poisoning in Bangladesh: Is There a Proper Estimate?. *Asia Pac J Med Toxicol* 3, 76–83. **https://doi.org/10.22038/apjmt.2014.3048**

5. Staudacher, P., Brugger, C., Winkler, M.S., Stamm, C., Farnham, A., Mubeezi, R., Eggen, R.I.L., Günther, I. (2021) What agro-input dealers know, sell and say to smallholder farmers about pesticides: a mystery shopping and KAP analysis in Uganda. *Environ Health* 20, 100. **https://doi.org/10.1186/s12940-021-00775-2**

Transforming rural livelihoods through training of private sector service providers

In 2025, PlantwisePlus equipped agricultural service providers (SPs) in Kenya, Uganda, Zambia and Bangladesh with the technical and business skills to deliver sustainable, bundled services to farmers.

Bundled services include pest diagnosis, IPM advice, spray services, and quality seed, strengthening **climate resilience** and **sustainable farming practices**.

We're building teams of local experts who can support overstretched public extension systems and improve livelihoods in rural communities.

790
SPs trained

3,512
peers trained

24k
farmers provided with tailored advice

14
women and youth-led businesses strengthened

A cost-effective training model

Investment in SPs

US$ 200
in training investment to create a decent job

Impact on SPs

US$ 1,838
average yearly earnings from providing services to farmers

Impact on farmers

30%
increase in farmer income

18%
reduction in poverty levels

47:1
average benefit-cost ratio

In 2025, the programme advanced beyond initial pilot efforts, scaling training and peer mentorship models across Kenya, Uganda, Zambia and Bangladesh. A total of 790 private agri-service providers were trained, with targeted participation of women and young entrepreneurs. These providers were equipped with the technical and business skills required to deliver bundled services to farmers, including plant health diagnostics and guidance on IPM and climate-resilient farm management, thereby strengthening **last-mile service delivery**. As a result, trained service providers are increasingly recognized as trusted sources of advice within their communities and have taken on leadership roles in local agricultural networks.

"I decided to revamp my small business because I had the courage, and I wanted to give my customers additional services besides selling inputs. I provide practical advice to customers before they purchase products such as insecticides, fertilizers, certified seeds and herbicides."

Anthony Ssenyonga an agro-input dealer and plant doctor in Uganda, who transformed his business after receiving PlantwisePlus training

This investment created a strong multiplier effect. Through structured **peer-to-peer mentorship**, trained service providers extended their expertise to more than 3,500 additional mentees and trainees, significantly amplifying reach beyond the direct participants. In Kenya, Uganda and Zambia, agri-service providers supported approximately 24,000 smallholder farmers in 2025, serving an average of 193 farmers each. As farmers adopted improved practices and accessed quality inputs, they reported increased productivity, stronger market engagement, and enhanced resilience to climate-related risks.

The mentorship model was adapted to fit the stage of PlantwisePlus engagement in each country. In Kenya and Uganda, where implementation began three to four years ago, 2025 marked a transition towards institutionalization and planned exit. Efforts focused on strengthening mentorship networks, formalizing partnerships with county governments and co-operatives, and collaborating with regulators such as the Kenya Plant Health Inspectorate Service (KEPHIS). Transition plans embedded advisory functions within local systems to ensure continuity beyond direct project support.

In Zambia, the focus was on building sustainable cassava seed enterprises capable of delivering both advisory services and disease-free planting material. This strengthened farmers' capacity to manage cassava brown streak disease while creating viable local businesses. Fifty-three smallholder growers completed formal seed certification with the Seed Control and Certification Institute (SCCI), and the newly established network of certified seed entrepreneurs was formally handed over to the Department of Agriculture for continued oversight and integration into national systems.

The mentorship model also delivered tangible **economic benefits** for service providers themselves. Across target countries, 71% of those trained in 2024 were actively operating, meaning that at least 805 of the 1,151 trained providers were already generating income. In Kenya, a survey of 161 active providers found that they earned a combined USD 33,138 from advisory services and input sales, equivalent to an average of USD 206 per month per provider. In Uganda, individual entrepreneurs reported one-off earnings of up to USD 800 from diversified service portfolios, highlighting the potential earnings achievable through bundled service delivery.

The model is also highly **cost-effective**. Establishing a viable agri-service enterprise requires less than USD 200 per trainee in direct training costs, yielding an estimated benefit–cost ratio of 47:1. This benefit–cost ratio indicates that every USD 1 invested in training generates approximately USD 47 in economic benefits. The benefits include income earned by service providers and additional income gained by farmers adopting improved practices (e.g. IPM). This calculation compares these combined benefits to direct training costs only, adjusts for the proportion of trained providers who actively operate as service providers, and excludes broader programme overheads. Complementary evidence from a recent PlantwisePlus study on paid agricultural services[6] indicates that fee-based advisory models, delivered through trained community providers, such as spray service providers and farm service

6. Khonje, M.G., Kadzamira, M.A.T.J., Romney, D., Mbugua, F., Ishii-Adajar, H., Bundi, M. et al. (2025) *Provision of paid agricultural services and welfare in Kenya*. Manuscript submitted to *Agribusiness*.

providers, can generate stronger welfare outcomes than informal farmer-to-farmer services. These providers were trained by CABI and partners to deliver services to smallholder farmers. The analysis found that access to paid services was associated with income gains of up to 30% among smallholders and an 18% reduction in poverty, compared to reliance on free advice from fellow farmers who had not received training through PlantwisePlus.

Looking ahead, CABI is strengthening partnerships with organizations like the Sustainable Agriculture Financing Facility, First Bridge Foundation, and the Zambian government to ensure sustainability and scalability beyond 2025.

Reaching farmers and impacting livelihoods

The **total PlantwisePlus reach in 2025 was 31.9 million farmers**. Farmer reach in the PlantwisePlus context refers to instances where plant health management advice is provided to farmers. The total reach includes both direct and indirect forms of communication through programme activities. Given that multiple interventions can be conducted in a geographic area in the year, individual farmers may receive multiple advisories on different issues and in these cases will be counted more than once.

Using the tools and training provided by PlantwisePlus, local partners directly reached over 5.6 million smallholder farmers with plant health advice and other services in 2025 across the 25 countries supported by core donor funding. This was achieved through a wide range of intermediaries and methods, as described in the previous sections, and marks a **30% increase in direct reach** compared to the preceding year. This was driven mainly by mass extension and SBC campaigns but also by plant clinics and related face-to-face outreach approaches, all of which saw a roughly 50% increase in the number of farmers reached. Based on multiple earlier studies on the sharing of information between farmers, it is assumed that farmers receiving advice through PlantwisePlus-related activities go on to share that information with an average of five other farmers. This assumption is not applied to farmers supported directly or indirectly by digital decision support tools as this has not yet been tested adequately. It is estimated that PlantwisePlus reached an additional 26.3 million farmers indirectly through farmer-to-farmer sharing.

Approximately 90% of plant clinic users fully or partly adopt recommendations given by plant doctors, and 94% of stakeholders who receive information through mass communication campaigns adopt new cultural practices.[7] Using a conservative figure of 90% adoption applied to all PlantwisePlus beneficiaries in countries supported by the programme core donors, in 2025 approximately 4.7 million farmers have applied new technologies or practices as a result of advice delivered through plant clinics, mass communication campaigns, and other complementary methods. Among the farmers receiving plant health advice through digital tools, 64% have reported using the advice. If extrapolated to all farmers reached through PlantwisePlus digital tools, this equates to an additional 0.2 million farmers integrating programme advice into their farming practices.

The above calculations mean that nearly 5 million farmers were adopting PlantwisePlus recommendations in 2025. From those, over 1.8 million are considered to have experienced increased yield. This is based on previously obtained evidence that 37% of farmers who had face-to-face consultations with advisors and 35% of those receiving information through SMS and mass communications reported improved yield. The number of farmers estimated to have benefited from increased income is over 1.9 million. This result is also based on evidence from earlier assessments showing that income increases were realized by 48% of farmers attending clinics and similar consultations, 28% of those receiving advice through SMS and mass communications, and 45% of those reached through digital decision support tools.

CABI and its partners collect data on the land area newly under IPM practices, including biological control or biopesticides, as a result of PlantwisePlus interventions. At the moment, such data are available through plant clinics that capture information on field size, through analysis of the number of biological control agents supplied to farmers for augmentative biological control, and through assessments of the spread of classical biological control agents. Based on the available data, the total area of land reached with PlantwisePlus-promoted IPM practices in 2025 is estimated to have been 228,032 ha. The majority of this was through advice given to farmers by plant doctors (221,613 ha). The papaya mealybug biological control agent is currently considered to be actively suppressing the pest population over 4,731 ha, now having spread across a large swathe of Kenya, supported by additional releases in new areas. Finally, biological control agents produced by local facilities in Pakistan are believed to have been used on over 1,688 ha of tomatoes and other crops to control insect pests.

7. Tambo, J.A., Matimelo, M., Ndhlovu, M., Mbugua, F. and Phiri, N.(2021) Gender-differentiated impacts of plant clinics on maize productivity and food security: Evidence from Zambia. *World Development* 145, 105519. **https://www.sciencedirect.com/science/article/pii/S0305750X21001315?via%3Dihub**;
Tambo, J.A., Uzayisenga, B., Mugambi, I., Onyango, D.O. and Romney, D. (2022) Sustainable management of fall armyworm in smallholder farming: The role of a multi-channel information campaign in Rwanda. *Food and Energy Security* 12, e414. **https://onlinelibrary.wiley.com/doi/full/10.1002/fes3.414**

Outreach method	Total farmers reached*	Male			Female			Unknown sex		
		<35	35+	Unknown age	<35	35+	Unknown age	<35	35+	Unknown age
Plant clinics, plant health rallies, farmer field days	465,277	105,298	162,353	32,508	24,975	37,637	29,203	615	901	71,787
Farmer trainings	18,598	3,675	10,533	0	1,239	3,080	0	53	18	0
Agri-service providers	25,589	5,596	4,222	2,733	4,305	3,713	2,082	0	0	2,938
Agro-input dealers	19,072	5,130	6,286	0	4,421	3,235	0	0	0	0
PRISE SMS pest alerts	1,053,907	0	0	502,922	0	0	547,744	0	0	3,241
Mass extension / SBC campaigns (e.g. radio)	3,680,793	229	400	1,739,734	194	360	1,532,492	0	0	407,384
Digital decision support tools	345,923	0	0	0	0	0	0	0	0	345,923
Subtotal	5,609,159	119,928	183,794	2,277,897	35,134	48,025	2,111,521	668	919	831,282
Farmer-to-farmer sharing	26,316,180									26,316,180
Total farmers reached	31,925,339									31,925,339

Table 1: PlantwisePlus 2025 reach figures* Reach figures are based on reports from partners in the 25 programme countries supported by core donors (excluding affiliate project countries (i.e. Burundi and China) and any other non-PlantwisePlus countries).

Promoting inclusion in agricultural advisory systems

In 2025, PlantwisePlus deepened its efforts to strengthen gender-responsive agricultural advisory systems in Zambia, Ghana, Pakistan and Bangladesh, building on earlier investments in capacity development and multi-stakeholder co-ordination. Significant progress was achieved through the establishment (in Zambia and Bangladesh) and institutionalization (in Pakistan and Ghana) of **gender technical working groups** (GTWGs), which have emerged as central mechanisms for advancing gender-responsive advisory reform. Through closer collaboration with government ministries, and expanded capacity development for extension staff, researchers, media professionals, and policy actors, these platforms are increasingly turning dialogue into practical changes in planning, co-ordination and service delivery. As GTWGs gain stronger government leadership and continuity, they provide a sustained institutional structure for embedding gender-responsive approaches within agricultural systems

In Pakistan, PlantwisePlus strengthened gender responsiveness across government extension systems by working through existing structures and driving change at **three interconnected levels**: the enabling environment, institutional systems, and individual capacity. By working through existing government structures rather than parallel mechanisms, the programme integrated gender within mainstream agricultural policy and service delivery, with progress now visible in co-ordination mechanisms, institutional reforms, and frontline practice.

- At the **enabling environment** level, the programme elevated gender as a strategic priority within federal and provincial agriculture departments, supported the integration of gender objectives into policy frameworks, and helped the GTWG evolve into a nationally owned co-ordination platform. The commitment of national institutions to continue convening this forum reflects growing ownership and sustainability.
- At the **institutional** level, PlantwisePlus built the capacity of extension leaders and training institutions to deliver inclusive advisory services. Gender-responsive tools introduced through the GTWG are now reflected in planning processes, curricula, and project design, and provinces have launched targeted services for women farmers, such as Haryani in Sindh and Pulla Pattay in Khyber Pakhtunkhwa. As a result, an estimated 75–80% of departmental plans now include gender components. Gender considerations are therefore increasingly embedded in routine extension planning and implementation, signalling meaningful institutional change.
- At the **individual capacity** level, extension staff strengthened their technical skills to deliver gender-responsive services, while several institutions introduced measures to improve workplace conditions for women staff, helping address barriers to recruitment, retention, and field participation.

Contributions of Gender Technical Working Group (GTWG) to gender mainstreaming in Pakistan

Launched in December 2022, Pakistan's GTWG unites government, academia, civil society, and the private sector to institutionalize gender-responsive agricultural extension services.

The result: Collaborative action has strengthened policies, diversified the workforce, and tailored programmes empowering women and men farmers nationwide.

GTWG's impact in Pakistan

PlantwisePlus continued to integrate gender considerations within frontline advisory services in 2025. **Gender-responsive facilitation approaches** were incorporated into plant doctor training and extension capacity strengthening activities, while service delivery models were adapted to improve accessibility for both women and men farmers. As part of this effort, the programme also addressed barriers to digital advisory access through targeted digital literacy initiatives (see the section on digital tools).

The programme strengthened women's and youth's roles in agricultural systems through partnerships with private sector and market institutions across Bangladesh, Kenya, Uganda and Nepal. In Bangladesh, collaboration with financial institutions supported women entrepreneurs; in Kenya, work with county authorities and exporters helped women- and youth-led groups enter formal markets; in Uganda, co-ordination with seed and input regulators helped embed young service providers in recognized systems; and in Nepal, partnerships with national agencies and NGOs revitalized community-based service models. Together, these efforts expanded market pathways and positioned women and youth as credible private agri-service providers.

Across behaviour change and communication initiatives, outreach strategies were designed to broaden access; these included radio programming, community forums, local-language delivery and participatory training methods in areas where women's access to extension services may be constrained. Gender-responsive approaches were applied in pesticide risk reduction and IPM campaigns to support inclusive participation. Participatory methods were also used in technical field activities, including biological control initiatives, to involve women farmers directly in demonstrations, knowledge exchange and community-level dissemination.

Leveraging affiliated funding

PlantwisePlus has established itself as a **highly replicable and scalable model** for strengthening national plant health systems, whose approach delivers measurable improvements in farmer decision-making, lower-risk plant protection, and system-wide resilience. Its adaptability across diverse geographic and institutional contexts is demonstrated through cases of new funders supporting affiliated projects based on PlantwisePlus elements.

PlantwisePlus Burundi, PlantwisePlus China and the ACIAR FAW Zambia projects are three of the strongest examples of cases where the programme has proved to be replicable and scalable. In addition, international agricultural organizations such the West and Central African Council for Agricultural Research and Development (CORAF), WFP and FAO, and other donor agencies, such as USDA and ACIAR, have **invested in new, related projects** in Southern and West Africa. Their investments have strengthened the development of plant clinics and extension capacity, supported further work on the mass rearing of FAW biological control agents, advanced assessments of pest-related trade risks within Southern African Development Community (SADC) member states and promoted lower-risk alternatives to synthetic pesticides.

PlantwisePlus Burundi (Netherlands Embassy in Burundi)

PlantwisePlus Burundi is scaling up efforts to strengthen the national plant health system and improve smallholder productivity through lower-risk, more sustainable crop production. Funded by the Embassy of the Kingdom of the Netherlands in Bujumbura, PlantwisePlus Burundi is led by CABI, in co-ordination with the national Institut des Sciences Agronomiques du Burundi (ISABU) and in collaboration with other government and non-government partners. The project started in quarter 3 of 2024 and builds on Plantwise Burundi (2020–2023), which strengthened the national plant health system through improvements in the delivery of farmer advisory services.

In 2025, nationwide access to plant clinics expanded to 221 clinics across all provinces and communes, covering 35% of all newly formed administrative zones. In 2025, these clinics provided timely, evidence-based advice to around 65,000 farmers. Strengthened plant doctor capacity and targeted extension campaigns are advancing lower-risk plant protection practices, while rapid response measures against the widely spread MMB, including a biological control agent rearing facility at ISABU, help protect farmer livelihoods. A major 2025 milestone was the formal endorsement and full integration of PlantwisePlus training modules into the Year 2 and Year 3 plant protection curricula of all 47 agricultural vocational schools across the country, embedding plant health diagnostic and advisory competencies within the national agricultural education system.

Efforts to reduce risks associated with crop protection practices were advanced through the launch of a national SBC communication strategy under the campaign identity *Umwimbu ku Bwacu*, promoting responsible pesticide use and IPM.

Phytosanitary strengthening started with the use of PlantwisePlus tools for horizon scanning for potential new pests, followed by PRA processes, the development and validation of contingency and pest management plans, and strengthened diagnostic and surveillance capacity. The official launch in 2025 of an updated national List of Regulated Pests represented a significant governance milestone, reinforcing risk-based plant health management aligned with international standards.

PlantwisePlus China (Ministry of Agriculture and Rural Affairs, China)

PlantwisePlus activities continued in China in 2025, funded by the Ministry of Agriculture and Rural Affairs. In Beijing and Sichuan, plant clinics continued to operate through agro-dealer shops, with agro-input dealers trained as plant doctors. Strengthening the technical knowledge and diagnostic skills of these suppliers ensures that farmers receive more accurate and reliable plant-health advice. This model also allows farmers to access recommended inputs at the same point of service, improving the overall quality, efficiency and convenience of plant-health support. Expansion accelerated in Sichuan following the release of the voluntary standard for IPM Demonstration Pesticide Stores, co-developed with PlantwisePlus. Linking plant clinic performance data to agroshop rankings improved routine data collection, service quality and support for IPM and pesticide reduction policies.

In 2025, more than 700 new and existing plant doctors were trained, and 34 additional clinics were established in Sichuan, bringing the national total to 261 shop-linked clinics. Over 37,000 farmers accessed services during the year. In Sichuan alone, more than 16,000 farmer queries were recorded, with over 5% validated by local teams and used to inform provincial agroshop rankings associated with the voluntary standard. These mechanisms are reinforcing data-driven decision-making while promoting lower-risk plant protection practices across both regions.

FAW management in Zambia (ACIAR, Australia)

In Zambia, PlantwisePlus activities are complemented by an ACIAR-funded project on 'Village-based biological control of FAW in rural Zambia' that is investigating the potential to use a naturally occurring pathogen as an augmentative biological control agent to help farmers manage pest populations. CABI, the Zambia Agricultural Research Institute, and the University of Zambia are assessing the feasibility of developing a *Metarhizium rileyi*-based biopesticide, leveraging each institution's strengths to generate evidence for potential commercialization.

Awareness-raising efforts launched in 2024 continued in 2025, reaching more than 1,400 farmers through demonstration plots and field days. These plots, hosted on Zamseed fields and co-run by CABI and Koppert SA (identified in 2024 as a potential commercialization partner) aim to familiarize farmers with biological control while also serving as a future commercial showcase. Youth champions, 60% of them women, were trained to lead community-level activities, strengthening local ownership. Participatory video processes placed women farmers at the centre of knowledge sharing, helping shift perceptions and opening more inclusive spaces for agricultural decision-making.

PlantwisePlus and One Health

One Health is an integrated, multi-sectoral approach that recognizes the interdependence of human, animal, plant and environment (including ecosystem) health. Pesticide overuse poses major One Health challenges, undermining plant resilience, harming human health through direct and indirect exposure, affecting livestock and wildlife via contaminated feed or water, and degrading ecosystems through soil and water pollution.

PlantwisePlus addresses pesticide overuse in several ways. At the **policy level**, the programme engages with cross-sectoral groups involved in regulation and governance across the pesticide lifecycle. Stakeholders from the agriculture, public health and environment sectors contribute to the development of evidence-based dossiers, post-registration reviews, co-ordinated data gathering, and drafting of policy recommendations on pesticide regulation. At the same time PlantwisePlus engages community-based stakeholders (including community health workers, agricultural extension workers, agro-dealers, market agents, lead farmers), as well as private sector partners, in SBC campaigns that foster shifts in the enabling environment and farmer practices leading to reduced pesticide risks.

At the **farm level**, plant clinics provide a cost-effective entry point for the delivery of demand-led advisory services. Plant clinics form one impactful component within the broader plant health systems framework that continues to guide PlantwisePlus. In Uganda, a joint crop–livestock clinic model is replacing the plant health-only clinics, providing holistic crop–livestock services, and is seen by local government actors as providing a cost-efficient platform for addressing priority One Health issues, such as antimicrobial resistance, mycotoxins, pesticides and nutrition. In Kenya, many farmer queries at joint clinics are about zoonotic disease. As a result, a One Health Illustration Manual was co-created with county representatives, providing community-level entry points for prioritized risk messaging. Several other countries are interested in piloting or scaling joint clinics.

PlantwisePlus also supports local governments to embed One Health in policy and practice. In 2025, CABI supported the co-development of a county One Health strategy with Taita Taveta County, Kenya, which integrates plant health, food safety and environmental conservation to enhance service delivery and resilience.

Overall, PlantwisePlus supports initiatives to advance integrated, sustainable solutions for healthier people, plants, animals and ecosystems.

Partnerships

PlantwisePlus is delivered through a dense and diverse network of partners. Initial stages of implementation primarily involve national government partners. However, as activities intensify and grow, organizations across the public, private and civil sectors join the programme, including regional and international organizations. Partners benefit from world-class expertise, locally led capacity building, and proven systems that **translate investment into lasting impact** for farmers, food systems, and the environment.

In 2025, PlantwisePlus worked with over **320 bodies** across governments, NGOs, research institutions and the private sector. Of these, 45% are within the government sector, reflecting the programme's efforts to secure buy-in and build sustainability. The region with the highest proportion of government partners is Africa, compared to Latin America, where the spread across partner types is more balanced. Meanwhile, in Asia, CABI has a high number of partners falling under the broader category of civil society organizations, which includes grassroots organizations and NGOs. Higher education / TVET organizations also play an important complementary role, reflecting the investment in education and training across outputs. In 2025, CABI engaged a further 11 public and private stakeholders (e.g. ministries, universities, farmer organizations, vocational institutes and private sector companies), extending the reach, credibility and sustainability of the programme's digital advisory offering.

"The partnership between NIPHM and CABI has been instrumental in driving innovation and resilience in plant health management that directly strengthens global food security."

Dr. Sagar Hanuman Singh, General Director of the National Institute of Plant Health Management, India, on how the partnership established under PlantwisePlus supports joint objectives

As the PlantwisePlus approach continues to demonstrate value, national and local governments are increasingly making **financial commitments** to complement the in-kind contributions they have provided since the beginning of the programme. Examples include the Nepalese and Ethiopian governments' commitments to funding plant clinics, and the MS Swaminathan Research Foundation's investment in promoting digital advisory tools. The financial value of such direct and in-kind contributions from in-country partners is estimated to exceed £1.5 million, compared to a total programme budget of £11.0 million in 2025.

At the same time, **private sector partners** are increasingly involved in plant clinics, disseminating information on pesticide risk reduction, co-ordinating SBC campaigns, and building stronger and more capable networks of private sector advisory services to support under-resourced public systems. They are also heavily represented in working groups and other bodies involved in regulatory reforms on pesticides and biopesticides. This engagement is particularly clear in the work of the CABI BioProtection Portal, where 28 private sector organizations (consumer goods suppliers, biological control manufacturers, etc) participate alongside 18 government and civil society organizations in the Portal's governing body.

This growing ownership demonstrates the increasing sustainability of the programme's interventions. Looking forwards, CABI will seek to highlight and celebrate these partnerships and continue expanding its network to ensure that the programme maintains its relevance to target groups and stakeholders, its coherence with other actors in the plant health system, and the sustainability of programme outcomes.

Programmatic challenges encountered and measures taken to address them

Lessons learned from digital tools and learning products

‘Failing fast’ with commercial opportunities

In 2025, CABI demonstrated a commitment to the idea of ‘failing fast’ and discontinuing investment in ideas to which the market was not responding. For example, CABI developed a concept called ‘AgriAssist’ which would bring together existing content and functionality from across the digital tools into a product that could be replicated easily and at low cost, maximizing the revenue that could be used for PlantwisePlus tool maintenance. A low-fidelity prototype was developed to demonstrate the concept. Positive feedback was received from potential end users, particularly those who are similar to the PlantwisePlus user base. However, it was not deemed to be an appropriate fit for commercialization with large-scale farmers, due to the expertise often being delivered in-house, as well as challenges with affordability and the requirement for CABI to customize an offering, which impacts the low-cost replicability model. In a second example, the CABI BioProtection Portal team investigated the cost–benefit returns on the offline app for the Portal, and found low usage and significant maintenance costs. As a result, the Portal offline app was discontinued. Whilst this means the Portal is no longer available offline, use patterns indicated that the number of offline users was very small, so minimal impact was observed.

Continuous design improvements are necessary to overcome digital gaps

Digital confidence gaps, connectivity limitations and language barriers persisted across contexts. PlantwisePlus addressed these by prioritizing offline-friendly tools, expanding translations, simplifying user journeys and introducing gender-responsive digital training. Analytics also highlighted when and where to intensify efforts, driving targeted investments in localization, training and institutional embedding.

Streamlining promotion approaches for best returns

Analysis showed that mass outreach campaigns for digital tools and learning products, though inexpensive per person, produced weaker conversion to active users compared to other approaches. In Bangladesh, high campaign reach yielded a low reach-to-user ratio of 0.88. In contrast, intermediary-led dissemination through extension services, spray service providers and agro-input dealers generated higher and more sustained engagement at lower long-term cost. Training-based pathways consistently produced the strongest returns. As a result of this, the programme has shifted to using intermediary and training-based approaches to promote the digital tools.

Tackling structural and behavioural barriers to pesticide risk reduction

In countries such as Bangladesh, Sri Lanka and Ghana, accelerating the transition to lower-risk pesticide alternatives remains a major challenge, as deeply entrenched pesticide-use practices are compounded by limited availability and affordability of, and perceived ineffectiveness of, lower-risk products. These structural and behavioural barriers slow uptake, even where awareness of risks is increasing.

PlantwisePlus is tackling these challenges through SBC campaigns that aim to establish a unified framework for promoting lower-risk pesticide alternatives. As part of this approach, in 2025, extension officers, agro-input dealers and producer groups were engaged as trusted intermediaries, while field demonstrations with private-sector partners showcased viable alternatives under local conditions. Capacity building across actors has emerged as both an outcome of, and a prerequisite for, effective SBC campaigns. By prioritizing practical, locally delivered training, the 2025 SBCs campaigns strengthened farmers' confidence in pest identification, safe pesticide handling and informed IPM decision-making. Strong participation by women in farmer workshops further highlighted the value of gender-responsive facilitation and local-language delivery in broadening inclusion and supporting sustained uptake of lower-risk practices.

Although meaningful progress has been achieved, persistent gaps in practices – including pesticide sprayer calibration, adherence to re-entry intervals, resistance management and record-keeping – demonstrate that behaviour change is gradual and non-linear. This experience reinforces the fact that SBC must be approached as a process of sustained reinforcement rather than a one-off intervention, with capacity building embedded across successive agricultural seasons to consolidate and scale adoption.

Overcoming scientific challenges in classical biological control

In Ghana, the programme faced a scientific obstacle while assessing the suitability of classical biological control for the Asian citrus psyllid. During pre-introduction surveys of the existing natural enemy complex, researchers identified a local parasitic wasp species that closely resembled the proposed biological control agent. This raised concerns that the proposed agent might already be present in Ghana, potentially weakening the scientific and regulatory case for importation. Genetic sequencing resolved the uncertainty, confirming that the local species is distinct from the exotic species being considered for introduction. With the taxonomic ambiguity clarified and parasitism levels confirmed as being low (<5%), the programme will support Ghanaian authorities in importing the classical biological control agent to Ghana. This will be achieved through south–south collaboration between Pakistan and Ghana. The agent is readily available in Pakistan, where it was previously successfully introduced for Asian citrus psyllid management.

Communication and visibility

In 2025, communications work aimed to **strengthen the credibility** and reach of PlantwisePlus among donors, policymakers, partners, and agricultural advisors by **demonstrating the programme's tangible impact** on smallholder farmers. To achieve this, the marketing and communications team focused on telling impact stories, increasing visibility of digital tools, and improving how audiences navigate and use our platforms, reinforcing PlantwisePlus's image as a trusted, evidence-driven programme that delivers significant change. A particular emphasis on human-centred storytelling brought the voices and experiences of farmers, extension advisors, and young agripreneurs to the forefront, helping diverse audiences connect more meaningfully with the programme's real-world outcomes.

Public relations, events, and press

Media engagement remained a major driver of programme visibility in 2025, helping to amplify scientific achievements, policy-relevant updates, and human-centred stories. These efforts enabled PlantwisePlus to continue reaching diverse audiences and maintain its reputation as a trusted source of expertise on sustainable crop health systems. PlantwisePlus generated **100 pieces of media coverage** in 2025, with an estimated **1.4 million views**.

The year's most notable coverage centred on the national approval of a biological control agent for papaya mealybug in Kenya, which featured prominently in ***The Star, People Daily,*** and other regional outlets. To amplify this, CABI strategically hosted a group of journalists at the Crop Protection Biological Control Laboratory at KALRO's Muguga campus in October, during the International Federation of Agricultural Journalists World Congress in Nairobi. Journalists observed first-hand how the parasitic wasp is reared and deployed as a biological control agent, helping Kenyan farmers reclaim papaya production. This targeted engagement resulted in five additional pieces of press coverage, including a feature in the Congress bulletin, which is distributed to over 60 countries and read by more than half a million people. In addition, CABI's impact extended to social media, with a LinkedIn post by a CABI scientist from the tour increasing reach when reposted by Media for Environment, Science, Health and Agriculture (MESHA; the local Congress organizers) and engaged by the official Congress account.

PlantwisePlus also maintained strategic visibility at prominent international events throughout 2025. Programme executive Dr Ulrich Kuhlmann received a **lifetime achievement award at the 11th International IPM Symposium** in San Diego, reinforcing CABI's credibility in the global IPM community. The programme held exhibition stalls at three additional high-profile gatherings (the Global Sustainable Development Conference in Istanbul, the Africa Food Systems Forum in Dakar, and the Annual Biological control Industry Meeting in Basel). These exhibitions showcased the impact of PlantwisePlus to sector leaders, strengthened existing partnerships, and created new connections within different networks.

A significant moment was in October, when PlantwisePlus celebrated five years of impact at the FAO Science and Innovation Forum in Rome. The programme and its core donors co-hosted a reception at the FAO headquarters, convening diplomats from donor and recipient countries, FAO colleagues, and agricultural researchers. The event offered a platform to showcase the breadth and depth of PlantwisePlus and to recognize the partnerships enabling delivery. At the Forum's exhibition space, delegates were invited to use two of the programme's digital tools, the Horizon Scanning Tool and the CABI BioProtection Portal, experiencing first-hand how the programme advances pest preparedness and sustainable crop protection. The occasion carried added significance, as CABI received a **Global Technical Recognition from FAO** in the Sustainable Plant Production and Protection category.

The CABI BioProtection Portal was also recognized individually, receiving a **Gold Stevie Award for Sustainability Initiative of the Year in Europe**. This made 2025 a landmark year for recognition of the programme. The awards generated valuable marketing opportunities through press coverage and social media amplification, simultaneously opening doors to new partnerships and networking with fellow awardees and industry leaders.

Digital communications and materials

Digital visibility was a major priority in 2025, with communications showcasing numerous real-life stories, alongside strategic improvements being made to the PlantwisePlus digital presence. The PlantwisePlus blog **published 70 articles** in 2025 and remains the programme's primary communications platform. The new '**Stories from the Field**' series was a standout success, featuring human-centred narratives focused on individuals whose lives have been transformed by the programme. The series resonated strongly with readers, with three of the eight published stories ranking among the year's top 10 most-read blogs and one claiming the top position.

- '**Youth leading Africa's food future: Meet Mary Mueni, a young Kenyan at the forefront of agribusiness innovation**' (number 1)
- '**The spray service provider using CABI digital tools to transform his business**' (number 3)
- '**Meet Florence Malemba, the virtual plant doctor reaching more farmers through video**' (number 9)

These stories were prominently featured on the website's impact page, creating a direct connection between storytelling and programme visibility.

Factual blog posts on topics such as common pests continue to be popular reads (e.g. '**10 common wheat pests**' and '**Managing mango mealybug**'). By linking readers to related tools such as the PlantwisePlus Knowledge Bank and CABI Academy, these posts enhanced awareness of CABI's digital resources and reaffirmed the organization's reputation as a trusted knowledge resource.

In 2025, blog performance remained strong and stable, maintaining approximately **87,000 views**, alongside a small increase in visitors, despite publishing volume remaining consistent. This sustained performance reflects a strategic shift that began in 2023, when the programme adopted a more selective, SEO-led content approach. The blog's strong search rankings demonstrate the efficacy of the SEO strategy, with search engines accounting for most traffic. Nevertheless, visitors arrived through diverse channels – and increasingly through AI tools. Ongoing efforts to boost cross-linking between the blog and programme website are improving overall user engagement and creating more cohesive journeys for audiences.

Several strategic enhancements were implemented on the PlantwisePlus website to bolster accessibility and user experience. A major focus was the **comprehensive expansion of the impact page**, transforming it from a basic landing page into a dynamic hub showcasing the programme's results via multiple formats. Specifically, the page now displays diverse impact content; this ranges from formal 'stories of impact' designed for donor and policy audiences, to conversational 'Stories from the Field' blog posts highlighting individual experiences, plus short stakeholder testimonials and hard data from the results dashboard.

Additional website improvements included a redesigned **resources page** that has streamlined access to tools, infographics and guidance materials, and **an interactive map** providing expanded country-level information for stakeholders seeking regional insights. The team also refined the navigation structure and introduced strategic calls to action throughout the site that clarify pathways for audiences to support, engage with, and benefit from PlantwisePlus.

In 2025, the PlantwisePlus website attracted approximately **10,000 visits, generating over 42,800 page views**. More significantly, visitors spent an average of 2 minutes 47 seconds on the site and completed 2.4 actions per visit, including page views, downloads, outbound clicks, and internal searches. This level of activity indicates that users are not simply landing and leaving, but actively exploring content, seeking specific information, and taking meaningful next steps. The metrics suggest the site successfully serves as both an information resource and a pathway to deeper engagement, whether through accessing tools, downloading materials, or connecting with external resources. Website traffic came from both people already familiar with the programme and those discovering it through online searches. Overall, 58% of visitors arrived directly and 29% arrived through search engines, demonstrating the site's dual role in serving existing stakeholders while attracting new audiences.

Social media was a significant component of PlantwisePlus's visibility strategy in 2025, particularly through the systematic repurposing of high-value content across channels. Human-centred stories developed for the '**Stories from the Field**' blog series were adapted into social media-friendly formats using strong imagery and first-person quotes, ensuring core messages reached diverse audiences across multiple channels. This approach proved highly effective, generating strong engagement and enabling impact-focused content to reach wider audiences across PlantwisePlus and CABI LinkedIn and Facebook channels, with standout posts **reaching 453,389 people and achieving 8,056 engagements**. In turn, this delivered a strong return on investment and maintained consistency in branding and tone.

In addition, knowledge information posts, including infographics on IPM, biological control and climate-smart agriculture, as well as practical tips for managing invasive species, were consistently popular and widely reshared. Across the year, the PlantwisePlus LinkedIn channel recorded **6,430 followers** and 97,023 impressions, with an average engagement rate of 3.5% (above industry average).

The team also launched a month-long paid LinkedIn awareness campaign to extend reach beyond organic channels and strengthen visibility among key stakeholder groups. The campaign generated 261,074 impressions and drove 817 engagements across the ads, demonstrating the value of strategic paid promotion in amplifying the programme's message and complementing organic content efforts.

Email communications retained their vital role in programme visibility throughout 2025, providing a direct channel through which to engage stakeholders, drive website traffic, and share timely updates. The PlantwisePlus monthly newsletter benefited from improvements to CABI's email infrastructure, including contact data reviews, list cleaning, and deployment of the ZeroBounce verification tool – efforts that enhanced deliverability and engagement. Over the year, PlantwisePlus sent 47 emails, achieving an average click-to-open rate of 30.64%. A notable success was the CABI BioProtection Portal's News Buzz newsletter, which quintupled its subscriber base from 1,147 to 5,860 through targeted opt-in campaigns linked to whitepaper downloads and website sign-up prompts. This expansion significantly strengthened the programme's reach within the sustainable pest management community.

Video was important within PlantwisePlus's content strategy in 2025, communicating impact in engaging and accessible formats. The **PlantwisePlus YouTube channel** attracted 244 new subscribers and recorded 25,500 views, all driven by organic discovery following the conclusion of paid advertising early in the year.

Content emphasized **real-world impact**, featuring videos on ***Trichogramma* biological control in Pakistan** and **digital tool adoption in India**. Further, **a suite of short animations** explaining the programme pathways and digital tools was particularly effective, achieving strong audience retention: 70–72% of viewers were still watching at the 30-second mark, and the animations were deployed at selected international events. All the animations were translated into French and Spanish, which proved valuable when presented at the African Food Systems Forum in French for the francophone audience in West Africa, and at the FAO Science and Innovation Forum in Spanish, one of the official UN languages. The programme also began experimenting with **YouTube Shorts**, with an animated piece on **how to put on personal protective equipment before spraying pesticide** achieving the highest view count to date.

PlantwisePlus publications

Every year, CABI staff and partners publish the findings of scientific, social and economic studies conducted under PlantwisePlus in articles in peer-reviewed journals and in working papers and study briefs in non-peer-reviewed publications. PlantwisePlus and PlantwisePlus affiliate publications from 2025 are as follows:

Key: Journal impact factor > 2.0: ↑ Open access: ☼

Peer-reviewed papers

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The **PlantwisePlus** vision is to empower women and men smallholder farmers to manage evolving plant health threats, increase their incomes, improve food security and safety, and reduce biodiversity loss by promoting sustainable crop production practices

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