

MADIPHS ENHANCES FAIR DATA





Hon. Chileshe Mpundu Kapwepwe gave a keynote speech (Credit: Lens Afrik)

OPENING ACCESS TO NICHE MARKETS



INVASIVE PESTS 'BOTTLENECK' IN S.SUDAN 8



#### CABI inaugurates the Africa Plant Health Systems Forum

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The inaugural African Plant Health Systems Forum has highlighted the strength of partnerships and knowledge-driven solutions towards greater sustainable food security for a growing African population expected to reach 2.5 billion by 2050.

CABI, organised and launched the event, which brings together representatives from CABI's African Member Countries, including government, development, research, farmer and private sector/industry colleagues, that was themed "Knowledge Driven Solutions for Africa's Plant Health Systems."

Chief guest Hon. Chileshe Mpundu Kapwepwe, Secretary General of the Common Market for Eastern and Southern Africa (COMESA) and Chair of the CABI Board, gave a keynote speech and said healthy plant health systems can benefit national, regional and continental development.

Hon. Chileshe Mpundu Kapwepwe said, "At COMESA, we understand that safeguarding plant health is vital not only for boosting agricultural productivity but also for enhancing intra-regional trade and economic integration.

#### **KNOWLEDGE FOR LIFE**

"This Forum serves as an important step toward enhancing Africa's collective voice on these issues, aligning with the broader goals of Agenda 2063 and the African Continental Free Trade Area, where plant health is integral to agricultural transformation and trade."

Dr Morris Akiri, CABI's Senior Regional Director, Africa, said, "Smallholder farmers often lack the tools, knowledge, and support needed to combat these issues effectively.

"Through partnerships, we leverage our expertise in research and data to develop innovative solutions, including biocontrol methods and integrated pest management strategies that are environmentally friendly and sustainable."

Meanwhile, Dr Eliud Kiplimo Kireger, Director General of the Kenya Agricultural and Livestock Research Organization (KALRO), said that by working in partnership with CABI and others, KALRO has tackled some of the most pressing plant health issues facing farmers, including the desert locust.

Dr Dennis Rangi, CABI's Director General, Development, said CABI has a long-standing commitment to advancing international development, with its work deeply rooted in the principles of collaboration and partnership.

Dr Rangi said, "By working together with our partners, we are amplifying our impact and driving innovative solutions that address the complex challenges facing agriculture and plant health worldwide. Our engagement with Association of International Research and Development Centers for Agriculture (AIRCA) exemplifies this approach."



## Communities take action against woody weeds in Lake Natron Basin



In this article, we look at how greater awareness and bottom-up approach to tackling woody weeds is leading communities to take action to reduce impacts in areas affected by *Prosopis juliflora* of Tanzania's Lake Natron Basin.

As part of a project, co-led by CABI and the Tanzania Forestry Research Institute (TAFORI), a focus has been on raising awareness about the starting invasion by Prosopis among many stakeholders in the Lake Natron Basin and the project has supported co-development of a management plan for this species.

An influential intervention was a visit by members of the Local Implementation Group to an area heavily invaded by Prosopis, where participants saw and heard about the effects of the invasion on the environment and livelihoods. Management of Prosopis by members of two communities around Lake Natron has resulted in removal of the trees on more than 20ha of communal land. The project provided training on the use of tree poppers and herbicide for Prosopis removal, and tools were provided to enable community members to engage in management activities. The people were motivated to participate in management actions because of project awareness raising and the strong engagement of two champions in Longido and Ngorongoro Districts.

A management plan has been developed and it is hoped that this will be adopted by Regions and Districts in due course. The plan includes training people to demonstrate management techniques to remove *Prosopis juliflora,* assess changes in stakeholder knowledge and perception of the problem as well as detailed mapping of where the weed is and where it is likely to spread.



## Changing behaviour around pesticide use makes farming safer



Chemical pesticides can be an important part of a pest management strategy. However, pesticides pose a health risk to consumers, farmers, animals and the environment when not used properly.

Ukulima True is an innovative agricultural project delivered by PlantwisePlus, the Department of Agriculture, Nakuru County, Kenya and the Centre for Behaviour Change Communication (CBCC). The campaign seeks to reduce the risks that pesticides pose to people within the food value chain. It does this by fostering safer pesticide practices, influencing change of positive individual behaviours and practices and supporting systems that facilitate these changes. The project also raises awareness of alternative safer plant protection products.

A social and behaviour change strategy and campaign strategy identified five interconnected groups of stakeholders. It put the farmer at the centre but linked them to other community members. It developed different communication strategies for each group. For farmers, the campaign ran mass media campaigns on the radio and delivered peer-to-peer learning and role modelling by farmer champions. For agro-dealers, it concentrated on training to enhance the dealers' ability to advise farmers. When communicating with extension workers, the campaign worked to build technical capacity.

The project has yielded strong results. Following the first phase of the campaign the number of farmers now monitoring their fields for pests before spraying has increased by 41%. The number of farmers who always use PPE has also increased by 28%. The number of farmers calibrating their sprayers has similarly increased by 28%.



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## Ghanian women's rights as farmers recognised more

Many more men and women are now recognising women's rights as individual farmers and agricultural extension service clients in Ghana – rather than as secondary household members, according to new research published by CABI.

Following interventions by the CABI-led global PlantwisePlus programme, both men and women in the eight districts/municipalities across Bono and Afaho regions now also recognise women's land ownership and property rights.

The findings of the research, which focused on the results of a social and behaviour change campaign, are outlined in the Study Brief 'Changes in women's access to extension services in Ghana: the impact of a behaviour change campaign. The Study Brief demonstrates positive changes in attitudes and societal



Both men and women in eight districts/municipalities across Bono and Afaho regions (Credit: CABI)

norms around women's roles in agricultural work.

A participatory radio series run on four stations featured local experts talking about key gender topics identified as barriers to equity by local stakeholders which included issues such as encouraging the use of agricultural technologies, land ownership and the sharing of decision-making roles on the farm.

The campaign involved working in partnership with the Directorate of Women in Agriculture Development (WIAD), the Directorate of Agricultural Extension Services (DAES), the regional and district Department of Agriculture in Bono and Ahafo regions, and Farm Radio International. As part of the work, 769 agricultural extension agents were trained to better consider and incorporate women into their extension activities. The agents are consulting women farmers to see how and when to conduct extension activities, considering the women's schedules, mobility constraints, and literacy levels.

Dr Hannah Nyamekye, International Development Consultant, said further work is needed in tackling some societal and cultural norms.

"Even when women farmers can access extension services, gender-based social norms and beliefs that stem from these – including that women should act as their husband's 'supporter' rather than be farmers in their own right – prevent them from engaging," Dr Nyamekye said.

The campaign also used community dialogues (durbars) to open discussion around these issues within rural communities. Here, they discussed and sought solutions to known socio-cultural issues and traditions that affect women farmers and prevent them from fully participating in and benefiting from agricultural services.



# MaDiPHS Data Catalogue,a key resource towards greater FAIR data

The importance of the Malawi Digital Plant Health Service (MaDiPHS) Data Catalogue has been highlighted as a key resource towards greater FAIR data in the agricultural sector at a workshop attended by various stakeholders in Malawi.

The MaDiPHS Data Catalogue – a vital resource built using the open-source Comprehensive Knowledge Archive Network (CKAN) API – is an example of the power of open-source tools in enhancing data management practices.

Held as part of the NIBIO-led project implemented in partnership with CABI 'Establishing a digital plant health service in Malawi,' the MaDiPHS Data Catalogue will ensure that the project partners and stakeholders can easily submit and share their datasets and knowledge resources (information on how to diagnose, prevent and manage pests, diseases, and weeds). These resources and datasets will be used to develop pest models that inform plant health advice to farmers in Malawi.



Mr Henry Mibei CABI's Manager, Digital Development said, "When it comes to harnessing the power of metadata, ensuring data is FAIR (Findable, Accessible, Interoperable, and Reusable) – through efficient Metadata Management is key."

The workshop brought together a diverse group

of researchers and data scientists from various organizations such as the Ministry of Agriculture (including DARS, DAES, DCD, and DAPS), LUANAR, DCCMS, IITA, TLC, and NSO.

Ms Boma Beddie-Memberr CABI's Project Officer, Data Policy & Practise said, "CKAN is renowned for its user-friendly interface, making it accessible even to those with limited technical expertise. The open-source model also allows for continuous improvement and customization, ensuring that the system evolves to meet the users' needs."

As part of the workshop, participants were guided through the catalogue's interface, learning how to navigate its various sections and exploring the types of data and resources available within the catalogue and hands-on sessions on how to perform effective searches within the catalogue.

One of the key skills also imparted was how to independently manage and organize metadata entries in the catalogue. At the end of the workshop, participants were equipped with the skills to independently update their metadata entries of the datasets for their organizations. The service is owned and managed by the Malawian government



### Zambia youth empowered to establish businesses in fall armyworm biocontrol



CABI experts recently held a training session in Lusaka, Zambia, empowering 20 youth farmers to seize business opportunities related to biological control of the devastating fall armyworm (FAW).

CABI together with the Zambia Agriculture Research Institute (ZARI) and the University of Zambia (UNZA) is implementing a project, funded by the Australian Centre for International Agricultural Research (ACIAR), to advocate village-based biological control of fall armyworm (*Spodoptera frugiperda*) in Zambia.

The training participants, hailing from four districts of Siavonga, Chirundu, Chongwe, and Mumbwa, were equipped with essential skills and insights into establishing businesses in the production, distribution and sale of biological control solutions to FAW, marking a significant step towards promoting sustainable agribusiness ventures among the youth.

Deogratius Magero, Youth Engagement Manager for CABI Africa, said "The comprehensive program covered a range of topics, including business opportunities in agricultural production of biological control products, service provision to farmers such as spraying of the biocontrol solutions, value-chain opportunities, financial literacy in business and the relevant business models."

Mr Magero explained, "By focusing on these areas, we provided a holistic understanding of how to create and manage successful agribusiness ventures in biological control of fall armyworm."

The youth will be further trained on the technical skills of farm-level production, collection and spraying of the biological control solution using the baculovirus Fawligen and the entomopathogen Metarizhium rileyi in September 2024.

Hassan Njobvu, a youth farmer said, "The training emphasized sustainable practices and business skills, equipping youth with the tools for success in modern agriculture and highlighting their crucial role in advancing food security and economic growth."



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## Public-private partnership approach to open access to niche markets



CABI-led research recommends a public-private partnership approach to open access to high-quality niche markets to help improve the livelihoods of smallholder fruit and vegetable producers in Rwanda and Zambia.

The study, published in the journal Sustainability, says there remains a paucity of understanding of market needs and quality and safety standards amongst smallholders which is limiting their market potential. Their plight is exacerbated by low-input, low-technology farming methods, and inadequate pre-and-post harvest handling.

Scientists from CABI's regional centre for Africa in Nairobi, Kenya, and its centre in Lusaka, Zambia, teamed-up with colleagues from JUVILE Options and Solutions Ltd and the Rwanda Agriculture Board and Animal Resources Development Board (RAB), for the research and interviewed 340 fruit and vegetable farmers (FFV) and key informants.

They found that the value chains for target FFVs are still traditional, predominantly targeting local markets. These markets pose low barriers to entry for smallholders, and often with few safety and quality requirements.

The researchers argue that, to bridge the gaps identified, farmers should be organized into legally recognised entities, to enable access to compliance information, reduce transaction costs, and provide access to high-quality niche markets through publicprivate partnerships.

They add that countries also need to develop industry codes of practice and quality management systems and support farmers to stick to them. Dr Morris Akiri, lead author of the study and CABI's Senior Regional Director, Africa, said "This paper uses a value chain analysis approach to assess the factors influencing compliance among smallholder fresh fruit and vegetable (FFV) producers in Zambia and Rwanda, and identify practices essential for achieving widespread compliance, to enhance the competitiveness of the sector."

> "Countries need to develop industry codes of practice and support farmers to stick to them"

The scientists add that the research offers practical insights and customised recommendations that are unique to the environments in Zambia and Rwanda.



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#### Pesticide Residue Monitoring Framework drafted for Kenya

A writeshop has led to the creation of a draft National Pesticide Residue Monitoring Framework for Kenya aimed at coordinating pesticides residue monitoring for domestic and export value chains.

This writeshop follows a series of virtual meetings that aimed at examining the situation on pesticide monitoring programmes for Kenya.

The writeshop was attended by representatives both public and private institutions including, the Ministry of Agriculture – Plant Protection and Food Safety Directorate (PP&FSD), Ministry of health Food Safety Division, Pest Control Products Board (PCPB), Kenya Plant Health Inspection Service (KEPHIS), Ministry of Agriculture, Agriculture and Food Authority Horticultural Crops Directorate (AFA-HCD), aak-GROW, Bureau Veritas, MicroEnterprise Support Programme Trust (MESPT), Fresh Produce Exporters Association Of Kenya (FPEAK), COLEAD, ReTraK, County Governments of Nyeri, Nandi, Makueni, Nyandarua, Mombasa and Meru.

The draft National Pesticide Residue Monitoring Framework for Kenya focused on six key areas including laws and regulations, national Maximum Residue Limits (MRLs), pesticide screening and risk assessment, and data management and reporting.

Other areas highlighted were the importance of the analytical laboratory and budget and funding arrangements that will support and sustain the national sampling and testing during the national residue monitoring process.

The next steps for the draft National Pesticide Residue Monitoring Framework for Kenya are to finalize it ensure that stakeholders are aware of the framework for review and validation and, pilot it before aiming to implement it fully. PlantwisePlus will continue to provide support for the implementation of the new framework.



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CABI, USDA, KEPHIS and PCPB representatives during the group discussions (Credit: CABI)

## Celebrating 10 years of biocontrol success: Rwanda's journey

Rwandan Agriculture and Animal Resource Board (RAB), CABI and its partners, are marking a significant milestone – 10 years of success in mass-producing biocontrol agents at their Rubona facility located in Huye district in Rwanda.

This achievement highlights Rwanda's commitment to sustainable agricultural practices through innovative pest management solutions, primarily the production of beneficial nematodes to fight pests such as the fall armyworm. Beneficial nematodes are naturally occurring microscopic worms that specifically target and infect insects. Rwanda's journey with beneficial nematodes began between 2014 and 2016, when a team of international experts from China, the UK, Kenya, and Switzerland transferred the technology for mass-producing these biocontrol agents.

In Rwanda, the facility has thrived, producing over 100 billion insect-killing nematodes per batch. This is enough to treat more than 100 hectares of field crops or seed beds that can later be transplanted to over 800 hectares. This milestone has positioned Rwanda as a leader in biological pest control in Africa.



Since the establishment of the biocontrol facility, several research initiatives have propelled Rwanda's expertise in nematode-based biocontrol.

One of the most notable advancements in Rwanda's biocontrol efforts came from Patrick Fallet, a PhD student at the University of Neuchâtel, Switzerland. Between 2018 and 2023, he developed application technologies for using nematodes above ground, particularly to combat the invasive fall armyworm, a significant maize pest in Africa.

Dr Fallet's work resulted in a gel-based formulation that allows for spot application of nematodes, making the control of fall armyworm more efficient and practical. His contribution earned him the prestigious Swiss Forum for International Agricultural Research (SFIAR) PhD-Award in 2023.

CABI's PlantwisePlus programme aided in the development of biocontrol measures targeting the tomato leaf miner, another major pest in Rwanda's agricultural sector.



#### Climate change-induced pests, major 'bottleneck' in South Sudan

Climate change-induced invasive crop pests remain a major 'bottleneck' to agricultural productivity and food security in South Sudan, according to new CABI-led research published in the journal 'CABI Agriculture and Bioscience'.

CABI scientists and colleagues say strengthening South Sudan's plant health system has the potential to contribute to reducing crop losses caused by pests such as the fall armyworm.

The researchers found, after collecting data from 960 smallholder farmers, that there was low access to plant health services, including advisory and extension, training, and information. There was also a high dependence on NGOs and UN agencies to provide plant health services, indicating a gap in government-led initiatives.

Fernadis Makale, one of the authors of the research and Scientist, Invasive Species Management at CABI, said, "The findings have crucial implications, requiring the need for service accessibility, government involvement in plant health systems, strengthening of the policy and regulatory frameworks, and inclusivity in service provision."

CABI's Plantwise programme, partnered with several stakeholders in South Sudan to strengthen the capacity



of agricultural advisory systems to address plant health challenges and enable farmers to lose less of what they grow.



#### How do Natural Enemies Field Reservoirs help control crop pests?



A CABI-led study has looked into how establishing natural enemies field reservoirs (NEFRs) in farms in coastal Kenya can help fight pests such as the papaya mealybug, an invasive insect species that affects a wide range of plants.

NEFRs are an inexpensive and accessible way for farmers to control pest populations. These on-farm rearing structures support and promote the growth of natural enemies. NEFRs consist of simple fixtures that provide a roof over trays or bins. These structures can be made of woven palm leaves and wooden poles, for example.

CABI scientists measured the effectiveness of NEFRs in controlling papaya mealybug through experiments on farms in Kenya's coastal counties, Kilifi, Kwale, and Mombasa. One of the most successful natural predators of the papaya mealybug is *Acerophagous papayae*. overall number of papaya mealybugs and increased *A. papayae*. This is because NEFRs promote parasitoid growth, which leads to more wasps controlling papaya mealybug populations.

Using NEFRs alongside classical biological control also led to a higher number of other papaya mealybug natural enemies. Researchers found multiple types of natural enemies in the experiments. The diversity of these natural enemies also increased. By constructing NEFRs on their farms, farmers are playing a role in the rapid multiplication and spread of the wasp.

Within two years of the first release in Kenya's coastal counties, the biocontrol agent was causing up to 75% mortality of the papaya mealybug and average papaya harvests almost doubled between treatment and control farms.

The researchers observed NEFRs decreased the



## How a training manual will support pesticide risk reduction in Uganda

In the evolving landscape of pesticide regulation and safety, well-crafted training manuals are indispensable tools. They ensure that people who use pesticides can effectively navigate and implement risk reduction strategies. These knowledge resources can become a blueprint for changing behaviour around pesticides among stakeholders.

Take agro-input dealers (or agro-dealers) for example. They play an important role in pesticide risk reduction, advising farmers on pesticide products and use. With the right training using carefully curated knowledge



Wear overalls



Wear rubber boots





Wear apron

Wear gloves

Wear protection over nose

and mouth



Wear ear protection

Wear a respirator

Wear eye protection

#### An excerpt from the manual: precautionary pictograms that appear on pest protection products

Wash after use

resources, such as manuals, they can boost their knowledge and practices in lower-risk pest control.

Many agro-dealers in Uganda have not received the necessary training or accreditation from regulatory bodies. A 2023 paper revealed that almost half of the sampled agro-dealers were unaccredited. Furthermore, only 16% of agro-input shops sold biopesticide

products. This was largely due to a lack of awareness, access and demand from farmers.

Over the past two years, PlantwisePlus has collaborated with Uganda's government to develop a module for its agro-dealer training, including a manual.

The manual covers two main subjects: (1) recognizing pesticide risk and (2) reducing risk through the use of bioprotection products. In the first section on recognizing risk, the manual includes information on defining highly hazardous pesticides. The second section of the manual describes reducing risk through the use of bioprotection products. It describes what bioprotection and its associated products are. The next section looks at accessing and selecting bioprotection products.

The course module and accompanying training manual have been developed primarily for agro-dealers to support them in understanding the concept of highly hazardous pesticides. It also allows them to advise farmers on lower risk alternatives for crop protection.

The manual will be formally delivered to MAAIF and Makerere University to incorporate into the main agrodealer training course.



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### CABI delivers training on production of extension materials for plant doctors in Namibia

CABI delivered a four-day training and write-shop on the production of extension materials to support PlantwisePlus plant doctors working to help improve the livelihoods of smallholder farmers in Namibia as well as local and national food security efforts.

The work was carried out as part of an initiative between CABI and the Food and Agriculture Organization of the United Nations (FAO) in conjunction with the Ministry of Agriculture, Water and Land Reform (MAWLR).

The aim of the workshop, which also included a write shop, was to help the plant doctors - working at 10 plant clinics in Namibia - produce and use extension materials such as Pest Management Decision Guides (PMDGs) and Factsheets.

These materials are important tools used by plant



Participants learn how to create and develop Pest Management Decision Guides and factsheets (Credit: CABI).

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doctors in supporting farmers to implement Integrated Pest Management (IPM) practices against a range of crop pests of national economic significance.

The first day of the training focussed on an introduction to PMDGs, IPM and CABI pesticide policies, international agreements on hazardous pesticides and various templates. The second and third days were dedicated to drafting and reviewing PMDGs.

During the last day, Dr Phiri and Dr Gurmessa focused on production of Factsheets on topics which emerged during PMDG development. In the end, 12 PMDGs and 4 Factsheets were drafted and reviewed. Ms Paulina Shilunga, representative of MAWLR, in her closing remarks highlighted that this is a great opportunity that helped build the capacity of the national experts on production of relevant extension materials.

She noted that these materials are crucial tools that would help extension staff to implement IPM practices. .



# Study reveals invasive Apple Snail could spread further in Africa



Invasive Apple Snail (Credit: CABI)

New research led by CABI and including the Kenya Plant Health Inspectorate Service (KEPHIS) reveals that the invasive Apple Snail – which threatens rice crops – could spread further in Africa.

A team of researchers from CABI working with KEPHIS, suggest that the South West along Tana River, Western Kenya, coastal areas of Kenya, are suitable for invasive Apple Snail invasion as well as other countries including Malawi, Madagascar, Uganda, Mozambique, Tanzania and Ethiopia.

Fernadis Makale, lead researcher of the study published in CABI Agriculture and Bioscience, said,

"Knowledge of the boundary of invasion is important in appropriate resource allocation in the surveillance and management of the pest."

The researchers argue that strict quarantine measures should be instituted and implemented to curb not just the spread of the pest in Kenya but into uninvaded regions. In terms of management options, the scientists say that farmers have mainly relied on cultural, physical and – on a desperate scale – a "trial-error approach" using chemical pesticides.

Mr Makale added, "Unfortunately, most of these management practices have proven to be either cumbersome, impractical, expensive or ineffective."

He said that, in order to manage and curb further spread especially to other risk areas, a range of other containment measures should be implemented. These include undertaking the training and awareness of and on invasive Apple Snail through National Irrigation Authority (NIA) with support of other country teams, physical/mechanical control through handpicking snails and crushing their eggs, and cultural practices like alternate wetting and drying of paddies.

The researchers conclude by suggesting that the Kenyan Government – through its relevant agencies - should bring together stakeholders in the rice value chain to immediately create awareness and institute the control measures proposed in their paper.



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