Biodiversity Challenge Funds Projects
Darwin Initiative, Illegal Wildlife Trade Challenge Fund, and Darwin Plus

Half Year Report

Project reference	**29-012**
Project title	Protecting biodiversity through biocontrol of papaya mealybug in East Africa
Country(ies)/territory(ies)	Kenya, South Sudan, Uganda
Lead Organisation	CABI
Partner(s)	Kenya Plant Health Inspectorate Service (KEPHIS), Kenya Agricultural and Livestock Research Organization (KALRO), National Museums of Kenya (NMK), National Agricultural Research Organization (NARO), University of Juba (UoJ)
Project leader	Ivan Rwomushana
Report date and number (e.g. HYR1)	HYR3
Project website/blog/social media	*https://www.cabi.org/projects/biocontrol-of-papaya-mealybug-in-east-africa/*

1. Outline progress over the last 6 months (April – September) against the agreed project implementation timetable (if your project started less than 6 months ago, please report on the period since start up to end of September).

Output 1: The *A. papayae* parasitoid released and naturalized in East Africa for the sustainable biological control of papaya mealybug and protection of native insect biodiversity.

Multiple mass releases were conducted across Kenya, South Sudan, and Uganda to control the papaya mealybug (PMB). In Kenya, with approval from the Kenya Standing Committee on Imports and Exports (KSTCIE), releases were expanded to five additional counties: Machakos, Tharaka Nithi, Embu, and Baringo. In Baringo, an emergency parasitoid release was carried out in response to severe PMB infestations at the request of local farmers and the county government. In Uganda, releases were done in Luwero, Mukono, Kayunga, and Wakiso districts, aided by the refurbished insect rearing facility at NARO, which enables large-scale releases. Natural Enemy Field Reservoirs (NEFRs) on selected farms also supported parasitoid establishment. In South Sudan, imported parasitoids from the CABI biocontrol facility in Kenya were released in three regions - Nesitu, Rajaf West, and East (Central Equatoria State) - targeting PMB infestations on papaya, okra, cassava, and hibiscus. Post-release monitoring in Kenya and Uganda has shown robust parasitoid establishment with dispersal exceeding 100km, significantly reducing PMB populations and reliance on chemical controls, consequently reducing the negative impacts on native insect biodiversity.

Output 2. Capacity of crop inspectors, small-holder farmers, extension providers and the general public enhanced on *in situ* management of *A. papayae* on sustainable management of papaya mealybug and biodiversity conservation.

During the reporting period, an additional 354 (185 female) farmers and 139 (36 female) agricultural extension officers across Kenya, South Sudan, and Uganda were trained on PMB biocontrol techniques and parasitoid and other natural enemy conservation in the field. Additionally, training on the integration gender in biocontrol work was conducted. To enhance awareness of PMB biocontrol efforts in Kenya, plant health rallies (PHRs) were conducted in

Baringo and Tharaka Nithi Counties. Through these PHRs, a total of 2,335 (960 female) farmers and community members were introduced to PMB biocontrol methods and the importance of conserving natural enemies. Further, before the introduction of the parasitoid in Machakos, Makueni, Embu and Tharaka Nithi counties, awareness and stakeholder engagement were conducted with 124 (50 female) agricultural extension officers. Additionally, over 1,000 information materials, including mini factsheets, Pest Management Decision Guides (PMDGs), and photo-guides on PMB management, were developed and distributed to help reinforce understanding of PMB biocontrol approaches and conservation of other native insects.

Output 3: Scientific evidence-base generated on impacts of classical biological control of *A. papayae* on livelihoods and native insect biodiversity.
Two journal articles were published on modelling parasitoid establishment and spread in Africa (https://doi.org/10.1016/j.biocontrol.2024.105628) and on the role of Natural Enemy Field Reservoirs in managing PMB (https://doi.org/10.1016/j.biocontrol.2024.105528), thus extending the project's reach to a broader scientific audience. Additionally, three abstracts on the parasitoid's impact on native insect biodiversity have been submitted to the upcoming Association of African Insect Scientists (AAIS) conference in November 2024. Endline biodiversity checklists for invertebrates in the biological learning sites are currently underway in Kenya and Uganda, with similar studies planned in South Sudan for 2025. Within this period, the use of A.I tools was also piloted in establishing the dispersal/spread of the parasitoid. Plans are on track to assess the socio-economic impact of the parasitoid.

Output 4. Information on classical biocontrol of papaya mealybug and conservation biocontrol approaches to support natural pest regulation and better management of biodiversity packaged and disseminated to increase farmer knowledge and technology adoption
Over 1000 mini factsheets, PMDGs and photo-guides on PMB and its parasitoids were produced for dissemination to farmers, extension officers and community members. Additionally, 5 blogs, news articles and media coverage across the three countries have occurred highlighting key project achievements and further raising awareness about the biocontrol.

2. Give details of any notable problems or unexpected developments/lessons learnt that the project has encountered over the last 6 months. Explain what impact these could have on the project and whether the changes will affect the budget and timetable of project activities.

Most of the activities are on track, while the slightly the delayed ones (socio-economic survey on impacts) are still within the schedule. No budget implications are expected.

3. Have any of these issues been discussed with NIRAS and if so, have changes been made to the original agreement?

Discussed with NIRAS:	No (Not applicable)
Formal Change Request submitted:	No
Received confirmation of change acceptance:	No

Change Request reference if known: Not applicable

4a. Please confirm your actual spend in this financial year to date (i.e. from 1 April 2024 – 30 September 2024)

Actual spend:

4b. Do you currently expect to have any significant (e.g. more than £5,000) underspend in your budget for this financial year (ending 31 March 2025)?

Yes ☐ **No** ☒ Estimated underspend:

4c. If you expect and underspend, then you should consider your project budget needs carefully. Please remember that any funds agreed for this financial year are only available to the project in this financial year. No underspend is anticipated at this time. CABI and partner expenditures within acceptable variance.
5. Are there any other issues you wish to raise relating to the project or to BCF management, monitoring, or financial procedures?
No.

6. Please use this section to respond to any feedback provided when your project was confirmed, or from your most recent annual report.
The project team welcomes the reviewers' comments on the Y2 annual report and progress of the project. However, the team wishes to address the feedback and overall rating. In our view, the review and final score do not accurately reflect the contents of the report and what was achieved. For instance, good quality evidence is acknowledged, however the reviewers' indicate that evidence is insufficient. Indeed, a number of attachments were shared and well labelled, however the reviewers' did not mention specifically which document was not provided. In some cases, evidence on the number of trainees (participants) who reported for sessions was noted to be missing, although this information was provided in the annexed reports and participants lists. Furthermore, an updated log frame version was used based on the Darwin proposal review comments, which was shared previously through a change request. It was assumed that the lack of response suggested this was acceptable. Therefore, for the next annual report the team proposes to report against the original log frame, as submitted with the original proposal to align with what is currently acceptable as the official project log frame. All evidence for what has been implemented will be better annotated and re-submitted when completing the annual report.

Checklist for submission

For New Projects (i.e. starting after 1st April 2024)	
Have you **responded to any additional feedback** (other than caveats) received in the letter you received to say your application was successful which requested response at HYR (including safeguarding points)? You should respond in section 6, annexes other requested materials as appropriate.	Not applicable
If not already submitted, have you attached your **risk register**?	Not applicable
For Existing Projects (i.e. started before 1st April 2024)	
Have you responded to **feedback from your latest Annual Report Review?** You should respond in section 6, annexes other requested materials as appropriate.	Yes
For All Projects	
Include your **project reference** in the subject line of submission email.	Yes
Submit to **BCFs-Report@niras.com**.	Yes
Have you **clearly highlighted any confidential information** within the report that you do not wish to be shared on our website?	Not applicable
Have you reported against the most **up to date information for your project?**	Yes
Please ensure claim forms and other communications for your project are not included with this report.	Yes