INTEGRATED MANAGEMENT OF FALL ARMYWORM IN RICE-BASED ECOSYSTEMS

Locations	Philippines
Dates	15/11/2020 - 31/12/2024

Summary

Rice is a food security crop in the Philippines. It is the second most important commodity after sugar cane. However, an invasion of the fall armyworm in Asia is damaging food crops, including rice, and threatening the food, nutrition and income security of millions of farming households. To sustainably manage this ferocious pest, an integrated pest management strategy is required. CABI is providing its expertise to help the country develop 'preparedness' strategies to mitigate the impacts of fall armyworm on rice production.

The problem

Rice is essential to the Philippines' food security and its economy. Each year, the country produces over 11 million metric tonnes of rice, making it the seventh-largest rice producer in the world.

But, a recent global invasion and seasonal migration of the fall armyworm *(Spodoptera frugiperda)* is threatening crop production and the food and nutrition

security of millions across Asia.

Fall armyworm is a transboundary pest. It was first detected in Africa in 2016. Since then, it has invaded countries in South and South East Asia. In the Philippines, fall armyworm was first reported to be damaging corn in 2019. DNA Barcoding studies by CABI revealed the existence of two strains – the Corn strain (C-strain) and the Rice strain (R-strain). It became evident that both strains damage corn.

In 2021, fall armyworm spread further afield and to rice. In the USA, rice is the fall armyworm's key host. However, little is known about the factors causing the invasion in rice.

To prevent the impacts of fall armyworm on the Philippines' key food security crop and counteract any level of invasions on rice, it is important to understand the dynamics of the fall armyworm within rice ecosystems. This will ensure that appropriate mitigation measures help to provide early warning and preparedness against any outbreaks in the country.

What we are doing

The main aim of this project is to develop a location-specific, ecologically-based integrated fall armyworm pest management strategy. By doing so, the strategy will provide future-proofing and adequate preparedness so that the Philippines can offset any future fall armyworm invasions.

Preliminary work on corn was carried out by CABI in other countries, looking at the biotic and abiotic factors and interventions. These helped to formulate an interim strategy. This project will focus on the country's key crop, rice. It will further consolidate outputs from the initial phase and evaluate location-specific, nature-based interventions against fall armyworm infesting rice.

The project will also develop communication materials and training to increase the knowledge of extension agents and farmers.

The objectives are to:

1. Monitor the presence in and around rice ecosystems and identify spatial and temporal fall armyworm population dynamics
2. Assess the level of infestation and damage on rice and non-rice habitats
3. Determine the diversity of, and role of, natural regulating mechanisms
4. Identify alternate host plants via host-plant specificity tests
5. Enhance the knowledge and capacity of local researchers and extensionists for risk analysis and management
6. Develop location-specific ecologically-based integrated fall armyworm pest management strategies and decision guides.

Key activities include identifying the strains of fall armyworm, clarifying spatial and temporal population dynamics, and ascertaining possible risk factors and damage on rice and other host plants. The diversity of naturally occurring beneficial organisms will also be determined and information from farmer Knowledge, Attitudes and Practices will be collated.

Results so far

CABI has assisted the Philippines in conducting population and damage assessments of fall armyworm at over 20 sites. These assessments helped to identify risk factors to explain the spread of fall armyworm, its damage and yield losses. Continuous monitoring is ongoing as well as vegetation analysis.

The diversity of naturally occurring beneficial organisms in rice- and non-rice habitats, and the role of natural regulating agents have been determined, while studies on alternate host plants of fall armyworm in rice- and non-rice habitats, and host-plant specificity tests have been completed.
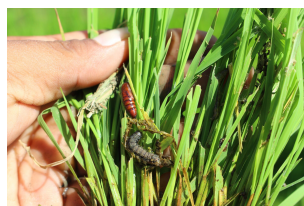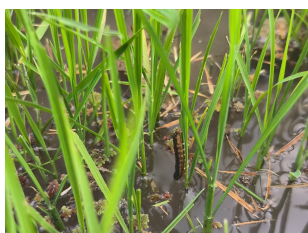
CABI has also assisted in developing location-specific, nature-based solutions, developed decision guides and identified some key natural enemies, including parasitoids.

Future plans will include piloting and field-testing location-specific nature-based integrated solutions for fall armyworm management and developing specific decision guides for extension agents for field implementation and communication to farmers.

Donors	Department of Agriculture, Philippines, Bureau of Agricultural Research, Philippines
Partners	Philippine Rice Research Institute (Dr Evelyn M. Valdez (Project Leader))
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