

AFRICAN CROP EPIDEMIOLOGY SYSTEM (ACES)

Locations Ethiopia, Kenya

Dates 19/11/2019 - 31/05/2021

Summary

The increasing frequency and severity of pest outbreaks (insects, pathogens and weeds) are causing huge crop losses in Sub Saharan Africa. Reducing such losses requires the application of robust plant protection measures by farmers at their own level. Pest-mediated crop losses exceed 50% in both West and East Africa, but losses in northwest Europe stand at only approximately 18%. The development and implementation of an efficient, resilient and integrated plant protection system, that is guided by effective surveillance and forecasting of outbreaks, will help provide a timely and effective response and is expected to narrow the yield gap in many countries.

The problem

Recent and current pest outbreaks in Sub Saharan Africa (SSA) include new races of rust on wheat in Ethiopia and Kenya, the rapid spread of brown streak virus on cassava throughout East Africa and onward spread towards West Africa, continued spread of banana bunchy top virus in East and West Africa, wide-scale spread of fall armyworm on maize and other crops across nearly all SSA countries and rapid spread of maize lethal necrosis in East. The effects of these outbreaks on farmers and their yields are devastating. Low yields cause lower

incomes and food insecurity.

Despite recurrent challenges of emerging epidemics, there is a tendency for governments to 'start from scratch' each time a new threat emerges, which is inefficient and risky.

This project is designed to explore and advance our understanding of model development and application in Africa, and to build strong and effective partnerships with national and regional partners. The results of this grant are expected to provide sufficient information on opportunities and potential solutions to develop one, or more, 5-year investments that will address transboundary pathogens and pests affecting smallholder livelihoods in SSA.

What we are doing

The project will take on 18 months of exploration and planning to establish the tools, technologies and partnerships needed to implement an early warning plant health system in East Africa and gather evidence to show that the proposed modelling and data approaches are feasible.

Working with partners, the project activities are organized into four Work Areas:

- **Work Area 1:** Model design, development, testing, and adaptation to country context; led by Cambridge Uni/CIMMYT
- **Work Area 2:** Data aggregation, management, cleaning and interoperability; led by Scriptoria
- **Work Area 3:** Landscape analysis of national and regional surveillance, early warning and response functions within current plant health systems; coordinated by CABI
- **Work Area 4:** Develop a 5-year roadmap incorporating country implementation plans and regional actions; led by CABI

ACES long-term vision of success is to have:

- Improved surveillance, early warning and pest response functions of managing plant health through use of epidemiological models
- Built the capacity of institutions to utilize and act on information generated by epidemiological models
- Enabled data to be shared and analyzed across institutions and national boundaries
- Contributed to significantly lessened crop loss of smallholder farmers and thereby contributing to improved food security in Sub-Saharan Africa
- Developed an effective and sustainable system that receives support from participating governments, donors and the private sector

Results so far

The project explored tools, technologies and partnerships needed to implement an early warning plant health system in East Africa and gathered evidence to show that the proposed modelling and data approaches are feasible.

The findings have been written into a proposed five-year road map for consideration by governments, donors and the private sector. A landscape analysis report was also written to document the current situation. In addition, the project, through funding from FCDO, explored existing systems for Desert Locust management in Eastern Africa and proposed how these could be improved for a better response to invasion in the future.

Donors

Foreign, Commonwealth & Development Office (FCDO), Bill and Melinda Gates Foundation

Partners

Scriptoria, The International Maize and Wheat Improvement Center (CIMMYT), University of Cambridge

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