AGRA Growing Africa's Agriculture
Bill & Melinda Gates foundation
Federal Ministry for Economic Cooperation and Development
The Rockefeller Foundation
UKaid from the British people
USAID FROM THE AMERICAN PEOP

AGRA knowledge series

Combating the Fall Army Worm: Gains in research and stakeholder engagement

By Michael Hilary Otim and Winnie Nanteza

Research Scientists at National Crops Resources Research Institute, Uganda.

The Fall Army Worm is a pest that took people by surprise in Uganda. Farmers reported observing its damage between 2014 and 2016, at a time that most people thought that global climate change had made the commonly known maize pests, the stem borers more damaging.

In 2016, it attacked one of the maize fields of the Cereals Research Programmme of NARO. The team that went there found that the pest was different from the stemborers, in its eating habit and inability to enter the stems of maize plants as the stem borers do. Consequently, samples were picked and sequenced in February

2017. The blast results confirmed the presence of a dreaded pest - the Fall Army Worm, Spodoptera frugiperda (FAW). Discovery of this pest sent the country into panic for immediate actions to contain its spread and damage. Accordingly, a national taskforce was formed to spearhead measures to manage the pest.

The National Agricultural Research Organization was represented in the taskforce, with key roles of identifying immediate solutions (synthetic insecticides) for controlling the pest, assessing its impact on yield and farmers' welfare, monitoring population and damage, and identifying biological control agents.

When the FAW first arrived in Uganda about four years ago, farmers, leaders and stakeholders on the maize value chain scampered for solutions. The Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) estimated a yield loss of about 15-75% depending on the intensity of infestation translating to a USD 192 million loss per annum. The reflex reaction for many countries, including Uganda, was application of insecticides.

In the heat of the moment, the government recommended and distributed synthetic insecticides to farmers and research was limited to testing effective insecticides for emergency action. In 2018, NARO with support from AGRA, initiated research efforts to; identify effective and benign insecticides for FAW control, assess yield losses and establish action thresholds. The intervention also set-out to enhance the capacity of stakeholders in FAW identification and management especially through packaging and disseminating best practices.

The project was initiated with a short baseline study to understand the way farmers were coping with the pest and their challenges. The baseline revealed variation in the choice and use of insecticides for controlling FAW. Farmers were using both approved and non-approved insecticides, under- and over-dosage, and not using personal protective equipment. Besides, it was established that farmers lacked information on the identification, biology and ecology of the FAW. This informed the development of training materials and conduct of the training.

We therefore developed an information kit on how to identify and manage FAW, basic information on pesticides, and safe use of pesticides. Fast-forward, because of the emergency intervention to manage FAW using chemicals, the team prioritized validation of various insecticides and has since identified and recommended to the MAAIF up to 13 effective insecticides.

Research also revealed that grain yield losses due to FAW infestation averaged 21% if one did not control it within the first 20 days after emergence. A maximum of three applications would suffice per season. Where FAW is present throughout, an application at intervals of 10 days was recommended as increasing the interval leads to more damage. However, it was noted that rainfall significantly reduced the population of FAW, which stabilizes yields.

On capacity building, we have to-date trained over 40,000 stakeholders including extension officers, research scientists and farmers, and held 12 radio talk shows to sensitize stakeholders on FAW. Indirectly, we have reached over 900,000 stakeholders with the information on FAW through radio talk shows and distribution of information materials among others.

Over time, we have learned that it is not necessary to always apply blanket application of insecticides, especially when there is heavy rainfall. Early planting and immediate action in case of high infestation is critical for good yields to be realized. The use of local languages is very helpful in delivering the information to farmers. The team must be grounded in several other areas of maize production since farmers have questions that go beyond the topic of interest. Misinformation and myths about the pest are bound to continue and will require regular sensitization.

The information will feed into developing more refined studies for developing a comprehensive management package for FAW. Safe use and handling of the pesticides will reduce the impact of insecticides on the users and the environment, as well as reducing the cost of production when farmers use insecticide judiciously than depending on calendar sprays.

However, FAW seems to be persisting and spreading. Control efficiency may further be complicated by the occurrence in Africa of the two known sister species of FAW with a preference for either maize or rice host plants. The existence of genetically diverse FAW populations could potentially pose threats to the effectiveness and sustainability of insecticides and genetically modified pest-resistant technologies currently being introduced into East Africa and beyond. This calls for more research efforts.