

AFLATOXIN CONTROL IN PAKISTAN

Locations Pakistan

Dates 06/01/2019 - 30/09/2021

Summary

Aflatoxins are a group of toxins produced by certain fungi – *Aspergillus flavus* – found in crops such as maize and groundnuts. These aflatoxins are toxic and can cause serious health problems for humans and livestock. They can also cause problems within the food chain because they contaminate crops, cause food safety, nutrition and security issues and consequently affect a country's ability to trade. Biological control is one way of sustainably handling aflatoxins in crops. In this project, CABI is working with USDA to test and register a native biocontrol product, locally termed as AflaPak^{TM,} for Pakistan.

The problem

Maize is the fourth most important crop in Pakistan. It is used across the food and feed industry and is consumed directly by humans and animals or in processed forms.

However, hot and humid climatic conditions in Pakistan promote the development of a fungus – *Aspergillus flavus* – which produces secondary metabolites, commonly known as aflatoxins. Aflatoxins are considered toxic

chemicals and their high levels in food (>20ppb; countries have different permissible levels) can cause serious health diseases, including liver cancer, stunted growth and sometimes fatalities. For animals, consumption of contaminated maize may cause deleterious effects on body structure and limit their milk production.

Besides this, international trading standards restrict the export of food commodities including maize, from Pakistan, that have aflatoxin levels greater than permissible levels. Consequently, these restrictions affect regional trade and cause economic implications for countries.

Biological control that uses native biocontrol agents is a sustainable approach to handle such issues without deteriorating the quality of produce.

What we are doing

The U.S. Department of Agriculture (USDA) has pioneered the biological control of aflatoxins in the form of a biological control product. Depending on the country and target crop, the name differs but is commonly known as Aflasafe™ and Afla-Guard™. This technology has been transferred to Pakistan and is trademarked as AflaPak™.

CABI has partnered with the U.S. Department of Agriculture (USDA), the National Agricultural Research Centre (NARC) and Rafhan Maize Products Co. Ltd, Pakistan, a food company that processes thousands of tons of corn each year to produce food products and ingredients, to form a working group that will help to implement this technology and to make AflaPak™ a standard product used by a range of producers and on multiple crops.

For CABI, the objective of this project is to build the capacity of the national agricultural system, including farmers, governments and stakeholders, on AflaPak™ – the fungal biocontrol product – and to register the product in Pakistan. CABI will carry out capacity building and training sessions with the aforementioned groups on aflatoxins, the management of them and the use of the biological control agent, AflaPak™. Training with these groups will help to improve the quality of food produced, improve livelihoods and increase regional trade prospects.

Once registered, AflaPak™ will be the first ever registered native biocontrol product of its fungal nature in Pakistan, opening up opportunities for even more green technologies to be adopted in Pakistan.

Results so far

The native biocontrol agent has been identified – nontoxigenic *Aspergillus flavus* to tackle the toxigenic *Aspergillus flavus* on maize crop. This biocontrol agent has been developed into a biocontrol product locally termed as AflaPak™.

CABI is currently evaluating the efficacy of AflaPak™ at seven maize growing districts of Punjab province in Pakistan. The positive outcomes of this work will help to advocate the commercialization and adoption of this biocontrol product in Pakistan.

A team of scientists from CABI, Rafhan Maize and the Crop Disease Research Institute (CDRI) at NARC have been trained on how to handle such biocontrol products through Cochran Fellowship at Virginia Tech Agricultural Tidewater Research & Education Centre, USA. This team will act as Master Trainers who will help to build the capacity of national scientists and stakeholders on the biological management of aflatoxins in Pakistan through capacity building sessions.

Donors

	United States Department of Agriculture, Foreign Agricultural Service (USDA-FAS), United States Agency for International Development (USAID)
Partners	Crop Disease Research Institute (CDRI), National Agricultural Research Centre (NARC), Pakistan Agricultural Research Council, Rafhan Maize Products Co. Ltd
CABI Project Manager	Sabyan Faris Honey






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