Current state of knowledge on groundnut aflatoxins and their management from a plant breeding perspective: Lessons for Africa

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Abstract

Groundnuts (Arachis hypogaea L.) are produced and consumed in several African countries due to their nutritious and hardy nature. However, they are prone to infection by aflatoxin producing Aspergillus spp. which can occur in the field or in storage. Aflatoxins are mycotoxins that contaminate a range of economically important crops. They are of great importance due to their effect on yield and marketability of food products. Exposure to aflatoxin through food and feed products poses a health risk to both humans and animals. Due to climatic conditions that prevail in Africa such as drought, excessive rainfall and extreme temperatures resulting from climate change and variability, aflatoxins are a big challenge. This paper sought to review key issues of aflatoxins in groundnut and current research efforts in their management from a plant breeding perspective. Varietal resistance to aflatoxin contamination remains a priority issue to effectively lower groundnut infection in farmers' fields. Resistance breeding using seed traits has significant G × E interaction which limits its response to selection and ultimately its use. Pre-breeding, development of biotechnology tools, knowledge of pathogen population diversity and understanding gene networks to aid selection have potential to enhance resistance breeding for aflatoxin management. These proposed interventions however require concerted and collaborative effort as they are promising in sustaining aflatoxin management.

Keywords: Aspergillus spp, Arachis hypogaea, Pre-breeding