



Photo: AgResults Aflasafe Nigeria Pilot Project

Aflatoxin –The invisible threat to Nigeria’s food security

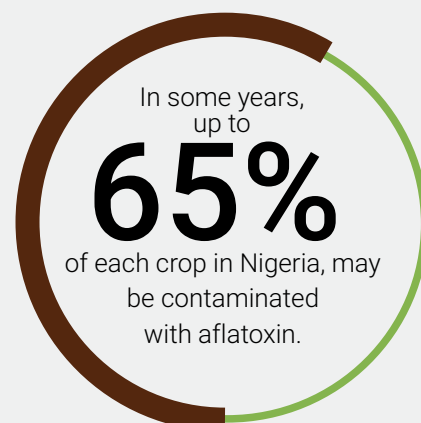
Aflatoxin is an invisible poison produced by the fungus *Aspergillus flavus*, which resides in soil and infects crops in the field. This toxic chemical, common in grains and other food crops, is a significant threat to food safety and security in many developing countries.

Aflatoxin contaminates several staple foods; in Nigeria, susceptible crops include maize and groundnuts.

aflatoxin contamination is a global problem affecting **4.5 billion** people in developing countries.



Maize and groundnut colonized by *Aspergillus flavus*.



Aflatoxin contamination can occur throughout the crop value chain. Visual inspection is inaccurate since clean-looking grains too could be contaminated. A chemical analysis is the only reliable way to determine aflatoxin content in food and animal feed.

AFLASAFE: A SOLUTION TO AFLATOXIN

Aflasafe is a biological control product that has proven to be a practical and effective method of reducing aflatoxin in the field. It out-competes toxin-producing fungi at source, provides protection during storage, and throughout the value chain.

Aflasafe is an innovative aflatoxin solution developed by IITA in collaboration with the Agricultural Research Service of the United States Department of Agriculture, University of Bonn, Germany and University of Ibadan, Nigeria.



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Aflasafe™ being applied on maize and groundnut farm.

Aflasafe

is broadcasted by hand on soil at a rate of **10** kilograms per hectare

40-45

days after planting



Bags of **Aflasafe™** containing 5 kg of product registered by the National Agency for Food and Drug Administration and Control (NAFDAC).

impact of aflatoxin



Economy

Aflatoxin has a knock-on effect on agricultural inputs, hindering investment in seeds, tools and fertilizers. Particularly hard-hit are the incomes of smallholder farmers.



Public health & nutrition

Aflatoxin causes about 30% cases of liver cancer globally. Africa has the highest occurrence. Contaminated feed decreases the productivity and profitability of livestock.



Food security

Aflatoxin contamination increases post-harvest losses and limits local and international trade.



Trade

Globally, about US\$1.2 billion in commerce is lost annually because of aflatoxin.

African economies lose about US\$450 million each year from lost trade opportunities.

Aflatoxin is also a non-tariff barrier for agricultural products exceeding permissible aflatoxin levels (four parts per billion [ppb] in the European Union).

Economic benefits ↑

24

Agribusiness Enterprises (Implementers) working with the smallholder maize farmers produced high quality maize that are paid an average of 14% premium by feed and food industries for their produce in four years.

Better health

70,000

smallholder farmer's households are benefitting, not including downstream maize consumers.

Adoption

20,000

smallholder farmers across Nigeria use **Aflasafe** as a tool to mitigate aflatoxin.

Reduced aflatoxin ↓

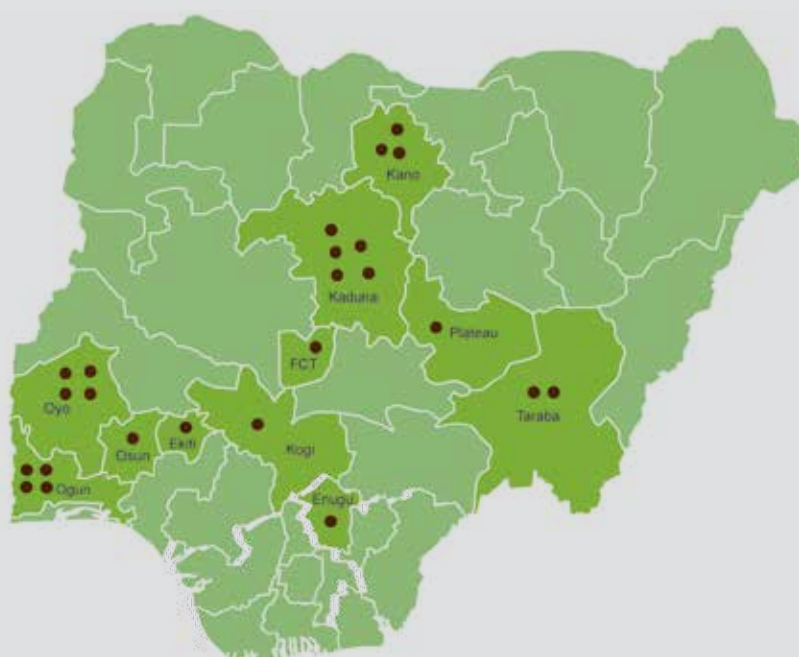
95%

of maize harvested from **Aflasafe**-treated fields over **4 years** contain **<10ppb** of aflatoxin.

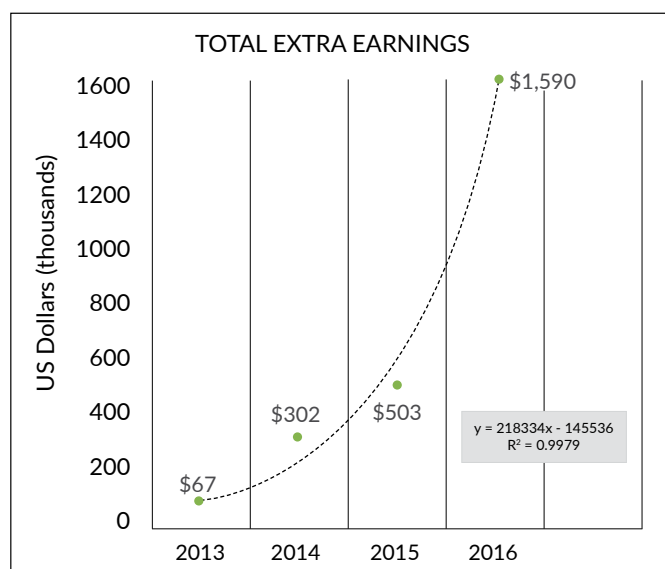
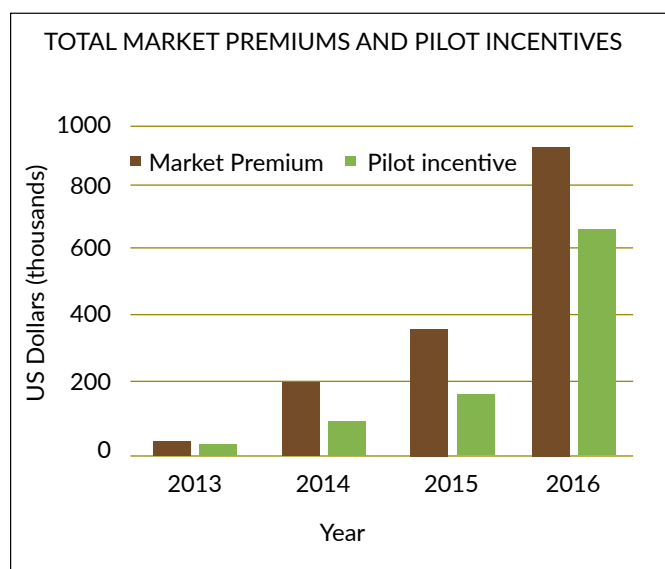
impact of Aflasafe

A SNAPSHOT OF THE AFLASAFE SCENARIO, 2013 TO 2017

Parameters	2013/14	2014/15	2015/16	2016/17
Number of implementers	4	9	16	24
Total Aflasafe purchased (tons)	24	58.2	64	168.6
Number of farmers	1,015	3,271	6,279	13,372
Treated area (hectares)	1,457	4,998	6,601	20,128
Average productivity (tons/ha)	3.9	2.6	2.6	2.8
Maize aggregated for sale (tons)	2,031	7,220	9,368	39,212
Samples with <10 ppb AF (%)	(n=660) 99.5%	(n=232) 96%	(n=268) 99%	(n = 1128) 85%
Samples with >70% Aflasafe strains	(n=88) 65-100%	(n=81) 65-100%	(n=292) 65-100%	(n = 854) 94%



National distribution of smallholder farmers using **Aflasafe** and implementers under the AgResults Pilot Project.



POLICY RECOMMENDATIONS

1. Promote the adoption of biological control by farmers. This will be the main pillar of an integrated approach to aflatoxin management, which can dramatically reduce contamination.
2. Sustain information campaigns/ awareness-raising targeted at educating consumers, farmers, families and stakeholders across the value chain
3. Encourage the private sector to invest in credible low-cost aflatoxin testing
4. Monitor foods and feeds in the market and enforce aflatoxin standard to drive demand

FUTURE PLANS FOR AFLATOXIN PREVENTION IN NIGERIA

- Scaling-up and commercialize through private (e.g., agriculture business), public (e.g., government institutions) and public-private partnerships
- Set up modular **Aflasafe** manufacturing plants to encourage local production, distribution and adoption
- License a mix of manufacturing, marketing and distribution roles to private/public sectors
- Provide stewardship and technical backstopping functions to the licensee

Further reading - R Bandyopadhyay, A Ortega-Beltran, A Akande, C Muteji, J Atehnkeng, L Kaptoge, AL Senghor, BN Adhikari and PJ Cotty. 2016. Biological control of aflatoxin in Africa: Current status and potential challenges in the face of climate change, *World Mycotoxin Journal* 2016, 9, pp 771–789.

Strengthening Aflatoxin control in Nigeria: Policy Recommendations - Based on findings of the country-led situation analysis and action planning (C-SAAP) conducted from 2016 to 2018 by the partnership for Aflatoxin control in Africa (PACA).

The AgResults Initiative is a partnership between Australia Government Department of Foreign Affairs and Trade, Bill and Melinda Gates Foundation, DFID, Government of Canada and USAID.

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