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.

In some years, up to 65% of each crop in Nigeria, may be contaminated with aflatoxin.

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.

**Aflasafe™** is broadcasted by hand on soil at a rate of 10 kilograms per hectare 40-45 days after planting.

- **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.
A SNAPSHOT OF THE AFLASAFE SCENARIO, 2013 TO 2017

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

Total Market Premiums and Pilot Incentives

**Total Extra Earnings**

\[
y = 218334x - 145536
\]

\[R^2 = 0.9979\]

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


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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