

## Evidences

### Study #2782

#### Contributing Projects:

- P342 - Technological and institutional innovations for assessing and mitigating food safety risks related to aflatoxins designed and tested, including capacity building
- P339 - Better evidence on foodborne disease in target regions

#### Part I: Public communications

**Type:** OICR: Outcome Impact Case Report

**Status:** New

**Year:** 2020

**Title:** Aflasafe Biocontrol Products to Reduce Aflatoxin in Maize and Groundnut are Registered in Ten African Countries and Available at 92 Distribution Points in Nine Countries

#### Short outcome/impact statement:

In 2020, Malawi became the tenth country where Aflasafe products are registered, bringing the total number of registered Aflasafe products to 14. Registration is critical for scale-up of Aflasafe. More private companies have started manufacturing and distributing Aflasafe products, making them available to thousands of farmers. To date, Aflasafe is available at 92 distribution points across nine countries. Private sector-led demonstrations have shown 98% effectiveness of Aflasafe in farmers' fields in Nigeria. Companies are bringing Aflasafe closer to users.

**Outcome story for communications use:**

IITA with the Agricultural Research Service of the United States Department of Agriculture has developed Aflasafe, a biocontrol product for controlling aflatoxins. In its initial research phase, Aflasafe was tested for safety, efficacy and for commercial viability. With safety and efficacy established and lessons on commercialization available, a scaling-out phase is underway. To date, 12 countries are pursuing registration and then various stages of commercialization. There are some common and some unique elements to the process of commercial scaling out in individual countries.

In each country, Aflasafe must be registered and for specific crops. A first step is to identify the strains of *Aspergillus flavus* present in the country that do not produce aflatoxins. These are then used to create a country-specific Aflasafe product. Multi-year field trials on farms are conducted in the main agro-ecological zones in a country. These trials are managed by farmers, using protocols provided by IITA and with oversight, as required, from government regulators. In all cases at least 80% and usually much greater reduction in aflatoxin levels were achieved. Other data for registration beyond efficacy in farm trials are: environmental safety through sampling *A. flavus* populations, cost-benefit analyses for farm use and assessments of potential profitability and business success (usually for use of crops in higher-value products). Registration has now been completed in ten countries -Burkina Faso, The Gambia, Ghana, Kenya, Malawi, Mozambique, Nigeria, Senegal, Tanzania, and Zambia. In all ten countries Aflasafe products are registered for use in maize, in nine for groundnuts (except in Kenya), and also for sorghum in Ghana.

Once national registration is approved, the technology transfer phase begins. Companies to produce and distribute Aflasafe are identified and they engage in a commercialization plan including a detailed business plan. Three companies have been licensed to manufacture and distribute Aflasafe products in four countries-BAMTAARE Services (in Senegal and The Gambia), HarvestField Industries (in Nigeria), and A to Z Textile Mills Ltd. in Tanzania. In Kenya, the Kenyan Agricultural and Livestock Research Organization manufactures and distributes Aflasafe KE01. IITA also produces country-specific Aflasafe products at its Ibadan production facility for Nigeria and other countries.

Now that production units are being established, distribution networks are following. In 2020, Koppert Biological Systems was licensed to distribute Aflasafe KE01 in Kenya and a private sector consortium was appointed as the local distribution and marketing agent. Now Aflasafe is available at 92 distribution points across nine countries.

**Links to any communications materials relating to this outcome:** <Not Defined>

**Part II: CGIAR system level reporting**

**Link to Common Results Reporting Indicator of Policies :** No

**Stage of maturity of change reported:** Stage 1

**Links to the Strategic Results Framework:**

Sub-IDOs:

- Reduced biological and chemical hazards in the food system
- Appropriate regulatory environment for food safety
- Increase capacity of beneficiaries to adopt research outputs

Is this OICR linked to some SRF 2022/2030 target?: Too early to say

Description of activity / study: <Not Defined>

**Geographic scope:**

- Multi-national

Country(ies):

- Mozambique
- Nigeria
- Tanzania, United Republic
- Zambia
- Gambia
- Burkina Faso
- Senegal
- Malawi
- Kenya
- Ghana

Comments: <Not Defined>

**Key Contributors:**

Contributing CRPs/Platforms:

- Maize - Maize
- A4NH - Agriculture for Nutrition and Health

Contributing Flagships:

- F3: Food Safety

Contributing Regional programs: <Not Defined>

Contributing external partners:

- A to Z Textile Mills Ltd.
- MAAH - Ministère de l'Agriculture et des Aménagements Hydrauliques (Burkina Faso)
- MECCNAR - Ministry of Environment, Climate Change and Natural Resources (Gambia)
- BAMTAARE SA
- FMARD - Federal Ministry of Agriculture and Rural Development (Nigeria)
- MASA - Ministério da Agricultura e Segurança Alimentar (Mozambique) / Ministry of Agriculture and Food Security
- USDA - U.S. Department of Agriculture
- Harvestfield Industries Limited
- MALF - Ministry of Agriculture, Livestock, Fisheries and Cooperatives (Kenya)
- MoA - Ministry of Agriculture (United Republic of Tanzania)
- KALRO - Kenya Agricultural and Livestock Research Organization
- MOAIWD - Ministry of Agriculture, Irrigation and Water Development (Malawi)
- Koppert
- SAPHYTO - Société Africaine de Produits Phytosanitaires et d'Insecticides
- MoFA - Ministry of Food and Agriculture (Ghana)
- Ministry of Agriculture (Zambia)
- MAER - Ministère de l'Agriculture et de l'Équipement Rural (Senegal)
- USAID - U.S. Agency for International Development

**CGIAR innovation(s) or findings that have resulted in this outcome or impact:**

Selected and shown below.

**Innovations:**

- 733 - Aflasafe TZ01 and Aflasafe TZ02 for Tanzania (<https://tinyurl.com/2zosmew4>)
- 735 - Aflasafe MWMZ01 and Aflasafe MW02 for Malawi (<https://tinyurl.com/2hfpqxgb>)
- 151 - Aflasafe product for the Gambia and Senegal made available for commercial use (<https://tinyurl.com/2jslrzbz>)
- 731 - [updated from 2017] Aflasafe product for Nigeria (<https://tinyurl.com/2h8ued9j>)
- 729 - Aflasafe BF01 for Burkina Faso (<https://tinyurl.com/2jmr2nzv>)
- 152 - Aflasafe KE01 for Kenya (<https://tinyurl.com/2eyjwdkb>)
- 730 - Aflasafe GH01 and Aflasafe GH02 for Ghana (<https://tinyurl.com/2eeamujy>)
- 719 - Aflasafe MWMZ01 and Aflasafe MZ02 for Mozambique (<https://tinyurl.com/2newdc4c>)
- 732 - [updated from 2017] Aflasafe product ZM01 and ZM02 for Zambia (<https://tinyurl.com/2gxpao2y>)

## **Elaboration of Outcome/Impact Statement:**

IITA in collaboration with the US Department of Agriculture and local African institutions have developed several biocontrol products under the tradename Aflasafe. In 2020, two more Aflasafe products were registered, for use in Malawi [1]. In addition, a commercialization strategy was developed, and a private sector distributor was appointed.

Now ten African countries - Burkina Faso, The Gambia, Ghana, Kenya, Malawi, Mozambique, Nigeria, Senegal, Tanzania, and Zambia - have Aflasafe products registered for use in maize; nine countries for use in groundnut; and in Ghana, for use in sorghum. Regulatory approval was based on results of multi-year farmers' field effectiveness trials conducted across different agroecological zones. Supporting data for registration included demonstration that atoxigenic fungi are native to target countries, effectiveness in hundreds of farmers' fields, environmental safety, benefits to farmers, and possibility to unlock premium markets as a result of treatment. Treating crops results in 80% to 100% less aflatoxin compared to untreated adjoining crops, both at harvest and in poor storage conditions [2-4].

Registration is a critical step in the pathway for Aflasafe scale-up. After regulatory approval, IITA begins working with public and private sector actors to transfer the technology to appropriate companies for them to manufacture and commercialize the products for improvement of food systems, boost trade, and protect public health. In 2020, IITA shared lessons learned from its 5-phased approach in turning a scientific innovation into a commercial product [5]. The approach can be adapted to any agricultural technology. Based on learning from the commercialization process, four guides were prepared for market assessment and strategy development; investor selection; structuring business relationship; and implementing the business development strategy [6-9].

In 2020, Koppert Biological Systems was licensed to distribute Aflasafe KE01 in Kenya and a private sector consortium was appointed as the local distribution and marketing agent [10]. By the end of 2020, there were three fully operational Aflasafe manufacturing plants, and the newest one by HarvestField Industries Ltd. (HIL) plant in Lagos, Nigeria will be fourth. The number of distributors continues to grow. Now Aflasafe is available at 92 distribution points across nine countries. With this expansion, several companies are bringing Aflasafe closer to the users and are providing training for correct use of the product independently after initial training of trainers by IITA. Private sector-led trainings and demonstrations show 98% effectiveness of Aflasafe in large number of farmers' fields across the six geopolitical zones of Nigeria.

## References cited:

- [1] IITA. Malawi registers Aflasafe®—The cost-effective technology for aflatoxin management. Published April 18, 2020 on <http://bulletin.iita.org/index.php/2020/04/18/malawi-registers-aflasafe-the-cost-effective-technology-for-aflatoxin-management/>
- [2] Agbetiamah D, Ortega-Beltran A, Awuah RT, Atehnkeng J, Elzein A, Cotty PJ, Bandyopadhyay R. 2020. Field efficacy of two atoxigenic biocontrol products for mitigation of aflatoxin contamination in maize and groundnut in Ghana. *Biological Control* 150: 104351
- [3] Senghor LA, Ortega-Beltran A, Atehnkeng J, Callicott KA, Cotty PJ, Bandyopadhyay R. 2020. The atoxigenic biocontrol product Aflasafe SN01 is a valuable tool to mitigate aflatoxin contamination of both maize and groundnut cultivated in Senegal. *Plant Disease* 104: 510-520.
- [4] Schreurs F, Bandyopadhyay R, Kooyman C, Ortega-Beltran A, Akande A, Konlambigue M, Kaptoge L, Van den Bosch N. Commercial products promoting plant health in African agriculture. *Critical issues in plant health: 50 years of research in African agriculture*, eds. Neuenschwander and Tamò. 2019. Burleigh Dodds Science Publishing. p. 345-363.
- [5] Konlambigue, M., Ortega-Beltran A., Bandyopadhyay, R., Shanks, T., Landreth, E., & Jacob, O. (2020). Lessons Learned on Scaling Aflasafe® through Commercialization in Sub-Saharan Africa. A4NH Strategic Brief. [https://a4nh.cgiar.org/files/2020/08/StrategicBrief\\_2020\\_A4NH\\_Aflasafe\\_web-1.pdf](https://a4nh.cgiar.org/files/2020/08/StrategicBrief_2020_A4NH_Aflasafe_web-1.pdf)
- [6] : IITA 2020. Aflasafe Technology Transfer and Aflasafe Commercialization (ATTC): Implementation of the Business Strategy. IITA, Ibadan, Nigeria. 37 pp. <https://bit.ly/3kJ2Qsk>
- [7] IITA 2020. Aflasafe Technology Transfer and Aflasafe Commercialization (ATTC): Investor Selection. IITA, Ibadan, Nigeria. 32 pp. <https://bit.ly/3bTFfkE>
- [8] IITA 2020. Aflasafe Technology Transfer and Aflasafe Commercialization (ATTC): Market Assessment and Strategy Development. IITA, Ibadan, Nigeria. 37 pp. <https://bit.ly/3b4BARO>
- [9] IITA 2020. Aflasafe Technology Transfer and Aflasafe Commercialization (ATTC): Structuring the Business Relationship. IITA, Ibadan, Nigeria. 29 pp. <https://bit.ly/302QMbN>
- [10] IITA. Production and distribution of Aflasafe KE01TM continue despite COVID-19 restrictions. Published June 19, 2020, on <http://bulletin.iita.org/index.php/2020/06/19/production-and-distribution-of-aflasafe-ke01tm-continue-despite-covid-19-restrictions/>

## Quantification:

**Type of quantification:** b) Extrapolated estimates

**Number:** 31870.00

**Unit:** hectares

**Comments:** In 2020, the Aflasafe licensee HarvestField Industries Ltd (HIL) sold 318.7 tons of Aflasafe in Nigeria. If all the Aflasafe sold was used by farmers, 31,870 ha would have been treated by the product. The sale data was obtained from HIL.

**Type of quantification:** b) Extrapolated estimates

**Number:** 18612.00

**Unit:** hectares

**Comments:** In 2020, the Aflasafe manufacturer Kenya Agricultural and Livestock Research Organization (KALRO) sold 186.12 tons of Aflasafe KE01 to the distributor Koppert Biological Systems in Kenya. If all the Aflasafe KE01 sold was used by farmers, 18,612 ha would have been treated by the product. The sale data was obtained from KALRO.

**Type of quantification:** b) Extrapolated estimates

**Number:** 170.00

**Unit:** hectares

**Comments:** In 2020, the Aflasafe licensee BAMTAARE sold 1.7 tons of Aflasafe SN01 in Senegal. If all the Aflasafe SN01 sold was used by farmers, 170 ha would have been treated by the product. The sale data was obtained from BAMTAARE.

**Type of quantification:** b) Extrapolated estimates

**Number:** 5920.00

**Unit:** hectares

**Comments:** In 2020, the Aflasafe licensee BAMTAARE sold 5.92 tons of Aflasafe SN01 in The Gambia. If all the Aflasafe SN01 sold was used by farmers, 5,920 ha would have been treated by the product. The sale data was obtained from BAMTAARE.

**Type of quantification:** b) Extrapolated estimates

**Number:** 5560.00

**Unit:** hectares

**Comments:** In 2020, the Aflasafe licensee A to Z Textiles Ltd. sold 5.56 tons of Aflasafe TZ01 in Tanzania. If all the Aflasafe TZ01 sold was used by farmers, 5,560 ha would have been treated by the product. The sale data was obtained from A to Z Textiles Ltd.

**Type of quantification:** b) Extrapolated estimates

**Number:** 15000.00

**Unit:** hectares

**Comments:** In 2020, A to Z Textiles Ltd. sold 15.0 tons of Aflasafe MZ02 in Mozambique. If all the Aflasafe MZ02 sold was used by farmers, 15,000 ha would have been treated by the product. The sale data was obtained from A to Z Textiles Ltd.

**Type of quantification:** b) Extrapolated estimates

**Number:** 31870.00

**Unit:** hectares

**Comments:** In 2020, the Aflasafe licensee HarvestField Industries Ltd (HIL) sold 318.7 tons of Aflasafe in Nigeria. If all the Aflasafe sold was used by farmers, 31,870 ha would have been treated by the product. The sale data was obtained from HIL.

**Type of quantification:** b) Extrapolated estimates

**Number:** 18612.00

**Unit:** hectares

**Comments:** In 2020, the Aflasafe manufacturer Kenya Agricultural and Livestock Research Organization (KALRO) sold 186.12 tons of Aflasafe KE01 to the distributor Koppert Biological Systems in Kenya. If all the Aflasafe KE01 sold was used by farmers, 18,612 ha would have been treated by the product. The sale data was obtained from KALRO.

**Type of quantification:** b) Extrapolated estimates

**Number:** 170.00

**Unit:** hectares

**Comments:** In 2020, the Aflasafe licensee BAMTAARE sold 1.7 tons of Aflasafe SN01 in Senegal. If all the Aflasafe SN01 sold was used by farmers, 170 ha would have been treated by the product. The sale data was obtained from BAMTAARE.

**Type of quantification:** b) Extrapolated estimates

**Number:** 5920.00

**Unit:** hectares

**Comments:** In 2020, the Aflasafe licensee BAMTAARE sold 5.92 tons of Aflasafe SN01 in The Gambia. If all the Aflasafe SN01 sold was used by farmers, 5,920 ha would have been treated by the product. The sale data was obtained from BAMTAARE.

**Type of quantification:** b) Extrapolated estimates

**Number:** 5560.00

**Unit:** hectares

**Comments:** In 2020, the Aflasafe licensee A to Z Textiles Ltd. sold 5.56 tons of Aflasafe TZ01 in Tanzania. If all the Aflasafe TZ01 sold was used by farmers, 5,560 ha would have been treated by the product. The sale data was obtained from A to Z Textiles Ltd.

**Type of quantification:** b) Extrapolated estimates

**Number:** 15000.00

**Unit:** hectares

**Comments:** In 2020, A to Z Textiles Ltd. sold 15.0 tons of Aflasafe MZ02 in Mozambique. If all the Aflasafe MZ02 sold was used by farmers, 15,000 ha would have been treated by the product. The sale data was obtained from A to Z Textiles Ltd.



### **Gender, Youth, Capacity Development and Climate Change:**

**Gender relevance:** 0 - Not Targeted

**Youth relevance:** 0 - Not Targeted

**CapDev relevance:** 1 - Significant

Main achievements with specific **CapDev** relevance: The effectiveness trials that pave the way for regulatory approval of the products are conducted as joint activities between IITA and local partners. IITA works with private companies to transfer the Aflasafe know-how and provides technical assistance in implementing the business plan. IITA's support includes training technical and sales staff on the integrity of the technology to increase their confidence during commercial deployment; providing technical assistance for structured awareness-raising and demonstration of the economic and social value of the product to different market segments using business cases; and support in setting up of their factory, quality control and staff training.

**Climate Change relevance:** 0 - Not Targeted

**Other cross-cutting dimensions:** NA

**Other cross-cutting dimensions description:** <Not Defined>

**Outcome Impact Case Report link:** [Study #2782](#)

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