



Aflasafe® technology transfer and commercialisation in Africa

Country status: Burkina Faso

September 2020

Burkina Faso's aflatoxin challenge

Aflatoxin is a poison produced by a naturally occurring fungus and leads to liver cancer and child stunting. Livestock have not been spared, and aflatoxin effects on animals too are deadly and costly. Besides maize and groundnuts, aflatoxin is also found in milk, chilli peppers and baby food. A 2016 study by the University of Ouagadougou (Burkina Faso) examined cereal-based infant formula produced in Burkina Faso and found that 84% of the samples contained aflatoxin B1. Burkina Faso's safety standard is 15 parts per billion in total aflatoxin content (ppb) for maize and groundnuts. The worst-contaminated had 87.4 ppb of aflatoxin B1. This is 900 times more than the safety limit of 0.1 ppb. Maximum allowable aflatoxin is set very low for baby foods, since babies are so vulnerable to the toxin, especially aflatoxin B1.

Aflatoxin

is a natural **cancer-causing poison** from toxin-producing types of the *Aspergillus* fungus. Because aflatoxin **contaminates food**, the effects of aflatoxin build up in our bodies and damage our health. As well as **causing liver cancer**, aflatoxin makes us weaker against other diseases and stunts children's growth. In some cases, aflatoxin in food can be fatal.

In large amounts, aflatoxin can make us ill or kill straight away (acute aflatoxicosis). But most of the time, we eat it without noticing. It can therefore gradually **infiltrate our bodies**, with its effects building up within us (chronic aflatoxicosis). For this reason, aflatoxin can be present undercover for many years doing us long-term harm, **yet very difficult to detect**. As with all ills, the best cure is prevention.



An earlier 2015 joint study by *l'Institut de l'Environnement et de Recherches Agricoles* (INERA) and the International Institute of Tropical Agriculture (IITA) found highs of 517 parts per billion (ppb) in maize and 356 ppb in groundnuts, while a 2010 study by the University of Natural Resources and Life Sciences (Austria) and IITA found that half of maize intended for human consumption purchased across Burkina Faso was contaminated with unsafe levels of aflatoxin B1 – the most toxic type. Groundnuts fared slightly better with about a quarter of samples containing aflatoxin, many within safe limits but still a cause for concern. However, all animal-feed samples were highly contaminated. Aflatoxin gets into animal products such as milk, and also makes animals ill and less productive.

The brewing industry requires an estimated to 160,000 tonnes of maize but sources less than 30,000 tonnes locally due to high aflatoxin levels. For the same reason, the World Food Programme has repeatedly found itself having to reject maize from local farmer organisations.

All this occurs despite Burkina Faso having an aflatoxin safety standard and despite long-standing scientific evidence on the deadly danger of aflatoxin in the country's food. An even earlier 2012 study by the United States Agency for International Development and IITA on aflatoxin contamination in maize reported between 3.6 and 636 ppb for aflatoxin B1 (the most potent natural carcinogen known), with an average of 67 ppb.

To date, there are still no national statistics on aflatoxin contamination, and no specific strategy on how to control aflatoxin even as sesame exports have been hampered by aflatoxin.

Geography	Area: 274,200 km ² Agroecology: Sahelian, Sub-sahelian, Sudanian and Northern-Guinea Neighbours: Ghana, Côte d'Ivoire, Mali, Niger, Togo and Benin		
Population	20 million, with 85% in farming		
Agriculture and Economy			
GDP	USD 14 billion (2018), with agriculture accounting for 40%		
Main crops	Sorghum, millet, maize and rice Main export crops: cotton and sesame		
Crop production and utilisation	Total arable land available for agriculture is estimated at 9m hectares. Agriculture is mainly rainfed, with only 11.5% under irrigation.		
	Area cultivated (million ha)	Annual production (million metric tonnes)	Annual per capita consumption (kg)
Sorghum	1.9	1.9	58.3
Millet	1.4	1.2	62.3
Maize	1.0	1.7	34.4
Groundnuts	0.4	0.3	3.0
Rice	0.2	0.4	21.1

Sources: *Direction des statistiques Sectorielles/DGESS/MAAH, 2020; Ministère de l'Agriculture et des Aménagements Hydrauliques (2009); Direction Générale des Etudes Statistiques Sectorielles (2009); FAO-ESS Food Security Statistics (2009)*

Aflasafe



In 2017, the intergovernmental *Comité permanent Inter-États de Lutte contre la Sécheresse dans le Sahel* (CILSS) approved the registration of Aflasafe BF01 to counter aflatoxin in maize and groundnuts in Burkina Faso. Aflasafe is **a safe natural solution** to the problem of aflatoxin, **homegrown in Africa** through national and international collaboration. It works from the plot to your plate to **stop contamination from reaching dangerous levels** and keep foods like maize, groundnuts and sorghum **safe to eat**.

Aflasafe tackles toxic tragedy using harmless types of *Aspergillus flavus*. Surprisingly, this is the same kind of fungus that produces aflatoxin, but in this case they are kinder cousins that **do not and cannot ever produce the toxin**.

Each country has its own version of Aflasafe using a mixture of four fungal strains, all found growing naturally in local soils. The friendly fungi are coated onto ordinary sorghum grain, which acts as a vehicle to help them get established, and can easily be broadcast onto fields.

Aflasafe is dyed blue using food colour, to distinguish Aflasafe from sorghum to eat. Aflasafe has the highest World Health Organisation standard for safety.

What have IITA and partners done about it?

IITA's Aflasafe BF01 was developed in close collaboration with *L'Institut de l'Environnement et de Recherches Agricoles* (INERA) and the United States Department of Agriculture–Agricultural Research Service, to fight aflatoxin. It was successfully tested for maize and groundnuts in 2012–2013, and officially registered in June 2017 by *Le Comité Sahélien des Pesticides of Comité permanent Inter-États de Lutte contre la Sécheresse dans le Sahel* (CSP–CILSS).

Through its Aflasafe Technology Transfer and Commercialisation initiative (ATTC), IITA recently entered a short-term non-exclusive agreement with a private company to import Aflasafe and test the market. ATTC trained the sales and technical teams, provided technical assistance to design and set up demonstrations, and multimedia marketing and advocacy tools.

In 2019, 4.1 tonnes of Aflasafe BF01 were applied on 364.5 hectares of maize and groundnuts to demonstrate both the performance of the product and its economic value. Aflatoxin contamination was reduced by about 94%.

By May 2020, 4,848 farmers from 13 farmer-based organisations have been trained, as well as 255 technicians from government institutions and NGOs, and 69 agribusiness agents. At the national level, ATTC is working with the Ministry of Trade, the Ministry of Agriculture and the *Confédération Paysanne du Faso* (CPF) – the country's apex body representing farmer organisations – to implement ReCMA–BF, a pilot project to control aflatoxin contamination in maize. ReCMA–BF stands for *Réduction de la contamination du maïs et sous-produits à base de maïs par les aflatoxines au Burkina Faso, Afrique de l'Ouest*. The project was launched in mid-2019.

Main partners in Aflasafe commercialisation

- Ministry of Agriculture
- *Direction Générale des Productions Végétales*
- *Direction Générale de la Promotion de l'Economie Rurale*
- World Food Programme
- 2Scale
- Alliance for a Green Revolution in Africa
- *Cadre Intégré Renforcé*
- *Confédération paysanne du Faso* (CPF)
- *Société Africaine de Produits Phytosanitaires et d'Insecticides* (SAPHYTO)
- Agroserv-Industrie
- InnoFaso

ReCMA–BF is managed by *Unité Nationale de Mise en Oeuvre du Cadre Intégré Renforcé* of Burkina Faso's Ministry of Trade, Industry and Crafts (*Ministère du Commerce, de l'Industrie et de l'Artisanat*) and funded by the Standards and Trade Development Facility (STDF). ATTC also signed a Memorandum of Understanding with the *Direction Générale des Productions Végétales* of the Ministry of Agriculture to facilitate the dissemination of the technology.

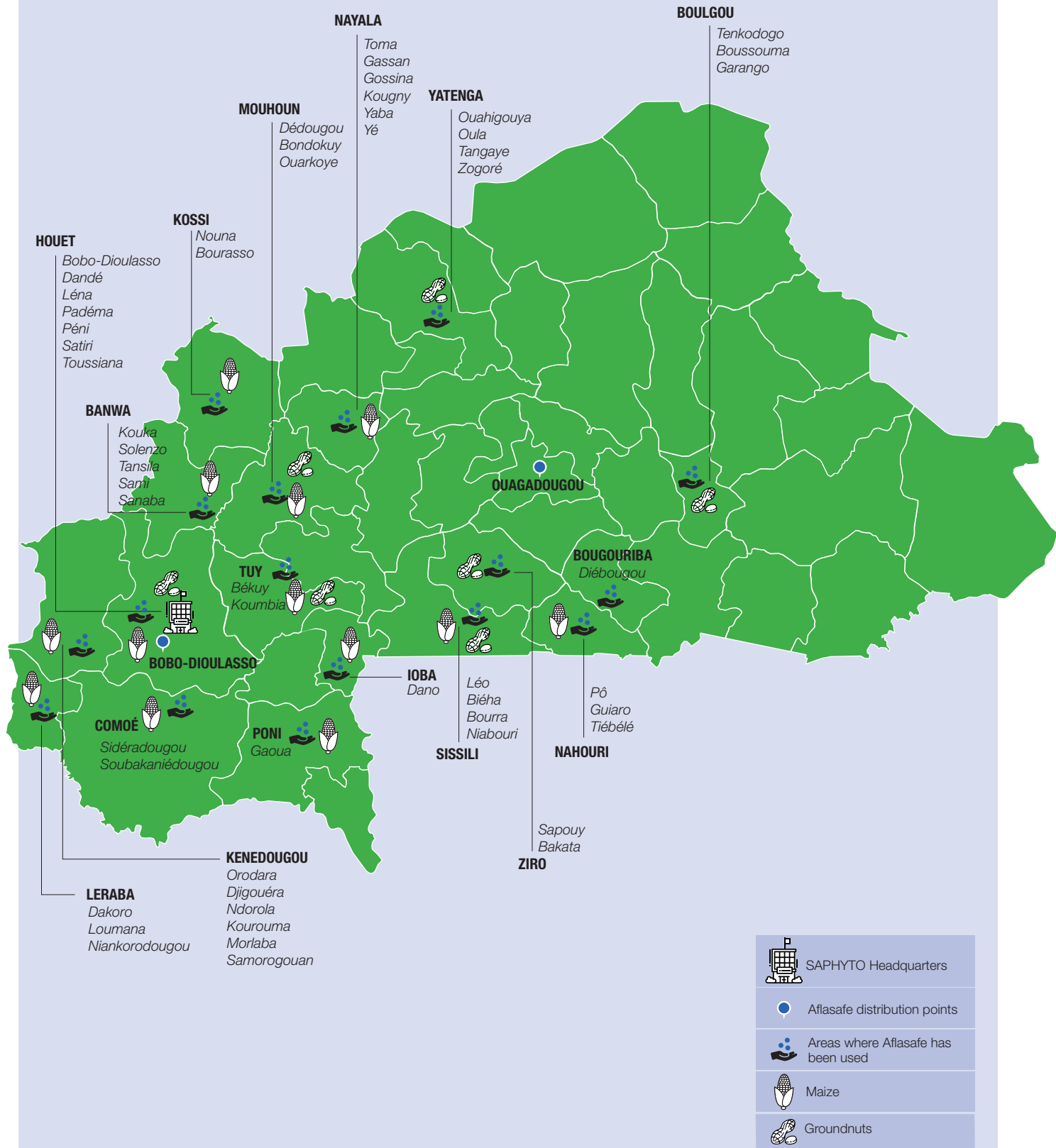
The project is testing a package of technologies, including Aflasafe, to control aflatoxin contamination along the maize value chain. Sixteen demonstration sites were set up across six provinces. The results from 2018 and 2019 contributed to the increase in the demand for the product. Indeed, in 2020, stakeholders requested for more than 160 metric tonnes (MT) of Aflasafe against an available stock of 130 MT.



Aflasafe contributes to two of the United Nations Sustainable Development Goals.



Locations of Aflasafe application: 2018–2020



What remains to be done?

Effective aflatoxin control is a 'shared responsibility', calling for concerted collective action by all. The government is indispensable.

Food safety is not as rigorously regulated as it should be. Therefore, the private sector should send a strong signal to farmers and intermediaries by rewarding quality. The government should not only formulate but also enforce appropriate food-safety policies and regulations. Effective collaborative action by the public and private sector to sensitise value-chain actors and consumers would increase the demand for safe food, and thus, for Aflasafe. The main factors limiting the uptake of Aflasafe in Burkina Faso include, among others, low consumer awareness on aflatoxin, lack of market incentives for aflatoxin-safe produce, poor enforcement of aflatoxin standards and low capacity for aflatoxin testing.

These barriers can be overcome through:

- **Greater public awareness of the health hazards and risks** from aflatoxin-contaminated food to drive consumer demand for aflatoxin-safe food. Based on its experience in carefully crafted awareness-raising in other countries that does not lead to public panic, IITA has useful lessons to draw from and would work in concert with in-country partners and Burkinabé government agencies. ATTC's modest efforts over the last two years have seen a marked increase in aflatoxin awareness, but much more needs to be done on a larger scale and through a strategically crafted and well-targeted campaign.
- **Mainstreaming standardised grading system for commodities and market incentives:** currently, large institutional buyers in the public and private sectors and industrial food processors employ and enforce a higher aflatoxin standard than the one set by the government. More of these proactive and food-safety-conscious cross-sectoral actions would see even more farmers routinely using Aflasafe.
- **Enhancing access and capacity for aflatoxin-testing** which could conceivably also reduce the high costs of mobile testing kits. The government, working with the private sector, can stimulate investments in establishing affordable and accredited testing – an area in which IITA can offer technical expertise.
- **Stricter enforcement of aflatoxin standards** in grains and food by regulatory bodies, could trigger policy change, including to a more rigorous enforcement of the aflatoxin-safety standards. This could lead to a stricter aflatoxin standard including for aflatoxin B1, in keeping with practice in some West Africa countries (Ghana, Nigeria) and the European Union.
- **More attention to aflatoxin by policy- and decision-makers:** Standing alone without facilitative mechanisms for their realisation, standards alone do not go far enough, even as they are an important starting point. With Burkina Faso having taken this first fundamental and facilitative step by establishing an aflatoxin standard, more needs to be done. For

assured public health, it is crucial that aflatoxin management be an integral part of national policies and national agricultural investment programmes. To enable this, IITA would work with the Ministries of Agriculture, Trade, Health and other development partners to train a critical mass of trainers on aflatoxin management along the entire agricultural value chains. The resultant ever-expanding pool of awareness and expertise would greatly improve the delivery of much-needed advisory support to value-chain actors, where, when and how the actors need it. It would require refreshing the existing curricula to incorporate modules on aflatoxin management and solutions, among them Aflasafe.

- **Increasing farmer access to agricultural inputs credit and support schemes** to stimulate full adoption of Aflasafe. This is an indispensable enabler for a product that is of crucial importance for public health, but whose effects are not readily discernible in a visual and concrete manner, such as improved crop yield or premium prices. Aflasafe is an 'invisible' solution to a likewise largely invisible and little-known but lethal problem, even as aflatoxin's effects are devastating on health and income, including at national scale. For this reason, there is a compelling case for government subsidies on homegrown Aflasafe, and for Aflasafe to be included in farmer input packages disseminated by the government and development agencies.
- **Mobilising resources** for mandatory field trials necessary for the regulatory extension of Aflasafe to protect other crops of nationwide significance such as sesame. Burkinabé authorities have expressed an interest in this extension to IITA, particularly for sesame which is a major export crop and foreign-exchange earner. IITA has the expertise and capacity for the extension, but lacks the funding to conduct the essential studies and mandatory trials.

For IITA, the search for a suitable Aflasafe commercialisation partner in Burkina Faso continues alongside demonstrating the economic value and public-health benefits of taming aflatoxin. To facilitate this, IITA has a capable and experienced research and business development team.

Another homegrown and equally sustainable solution is the institutionalisation of aflatoxin management in the curricula of extension officers. This includes the integration of a module in the training manual for farmers. The outcomes from the ongoing RECMA– BF could provide a timely – and opportune – starting point for a long-lasting and self-sustaining solution.

Effective Aflasafe dissemination will be a double score, boosting public health through aflatoxin-safe food while by the same effort also simultaneously giving the country's crop value chain a crucial and meaningful competitive edge. Crop processors, aggregators and producers will have increased access to lucrative local and external markets, thus improving turnover and profit margins.

atTC
aflasafe
Safer food in Africa

Implemented by:



Funded by:

BILL & MELINDA
GATES foundation



For more on Aflasafe in Burkina Faso, visit : <https://aflasafe.com/aflasafe-where-i-am/country/burkina-faso>