

AFLASAFE: An overview and current state of its registration in Ghana

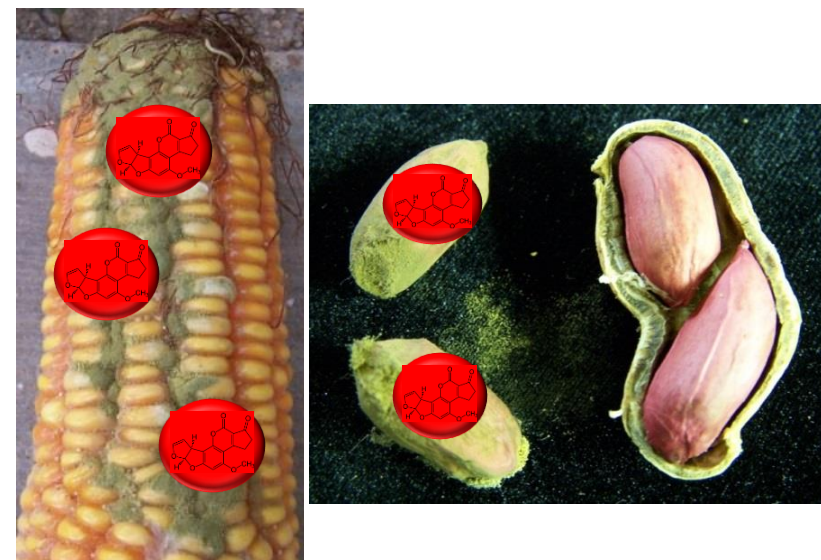
By

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on behalf of

IITA biocontrol team and Ghanaian Partners

March, 2017



Maize and groundnut kernels colonized by *Aspergillus species* and contaminated with aflatoxins

- Aflatoxin contamination of staple crops is perennial in Ghana with substantial adverse impact on public health and the economy .
- A concealed public health menace affecting humans (mostly women and children) animals.
- Management strategies in Ghana focuses largely on post-harvest stages of the crop.
- Field management is minimal and combating the source of crop contamination is non-existent in Ghana

Naturally, some strains produce aflatoxins (**toxigenic**) while others do not (**atoxigenic**)

Atoxigenic strains co-exist with toxigenic relatives and present in soil and on crop

Increase the frequency of atoxigenic strains & shift the population profile

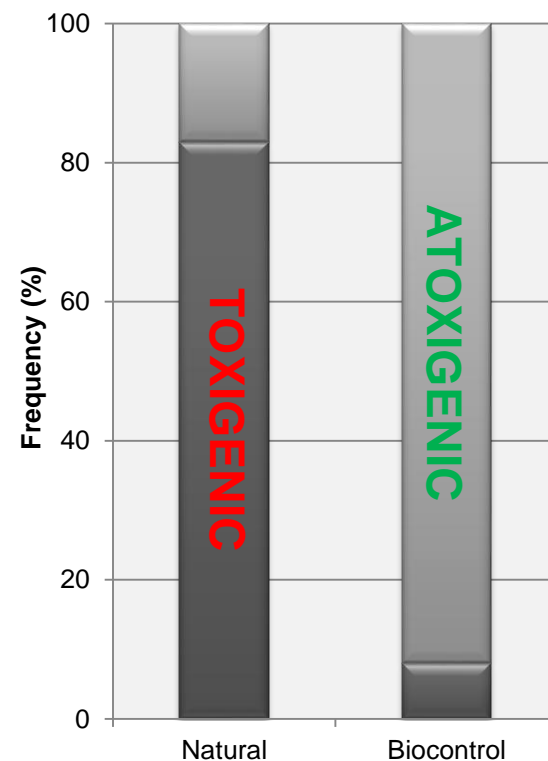
Consequently, reducing aflatoxin contamination

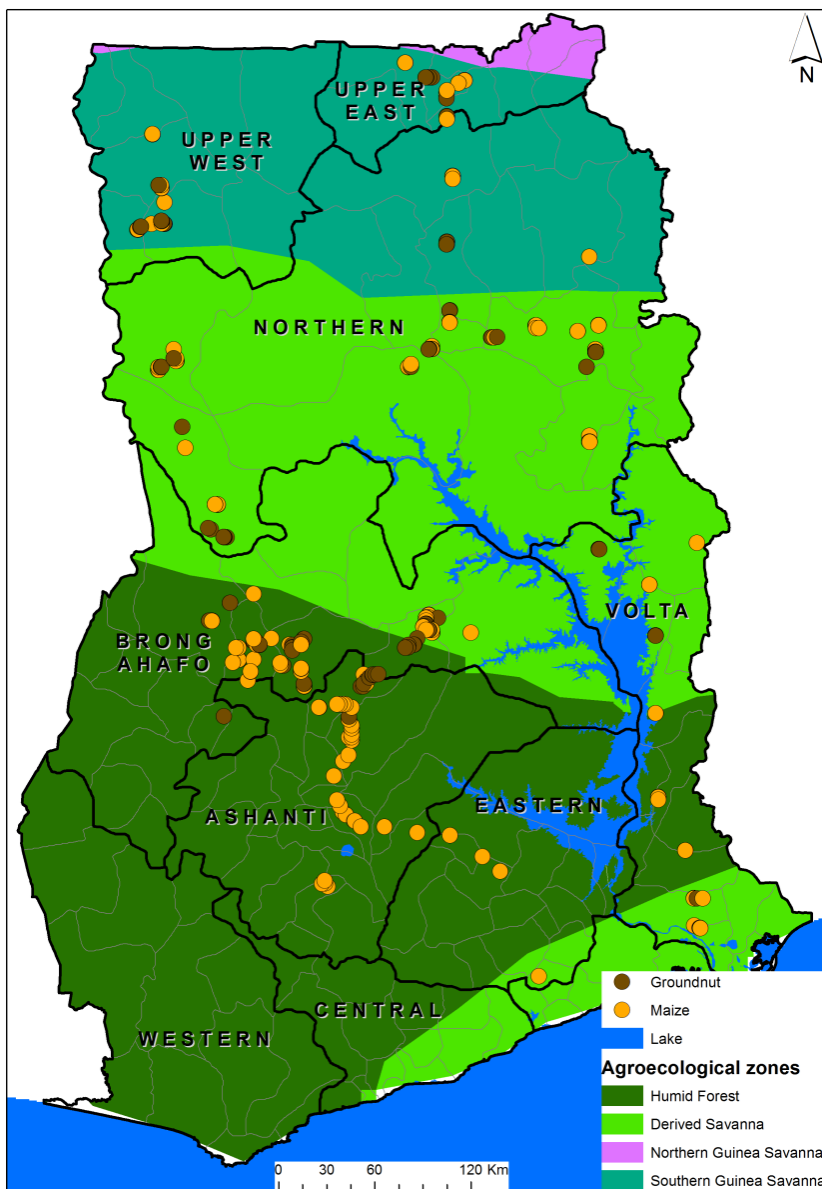
Application of atoxigenic strains can be done without increasing infection and without increasing the overall quantity of *A. flavus* on the crop or the environment

Strains protect crop from field to store

Multiple year & multiple crop benefit

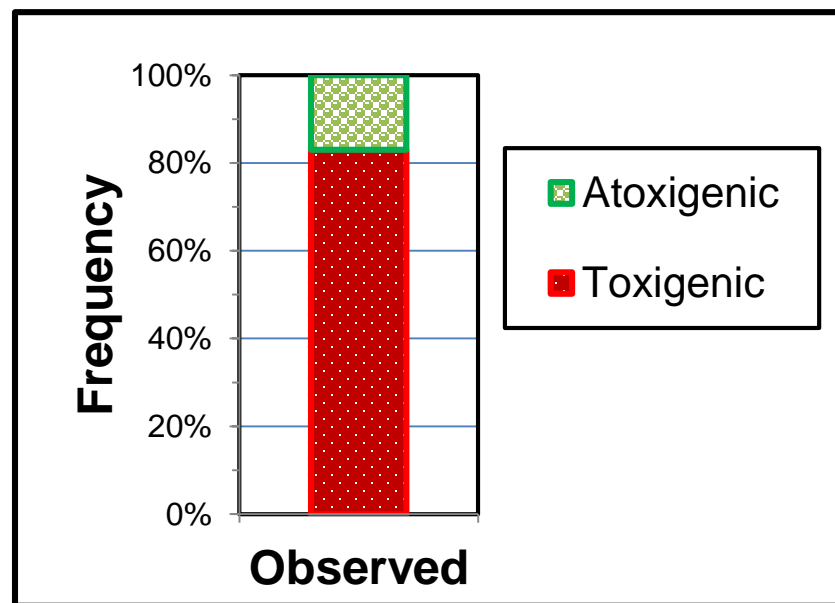
Only native strains used.



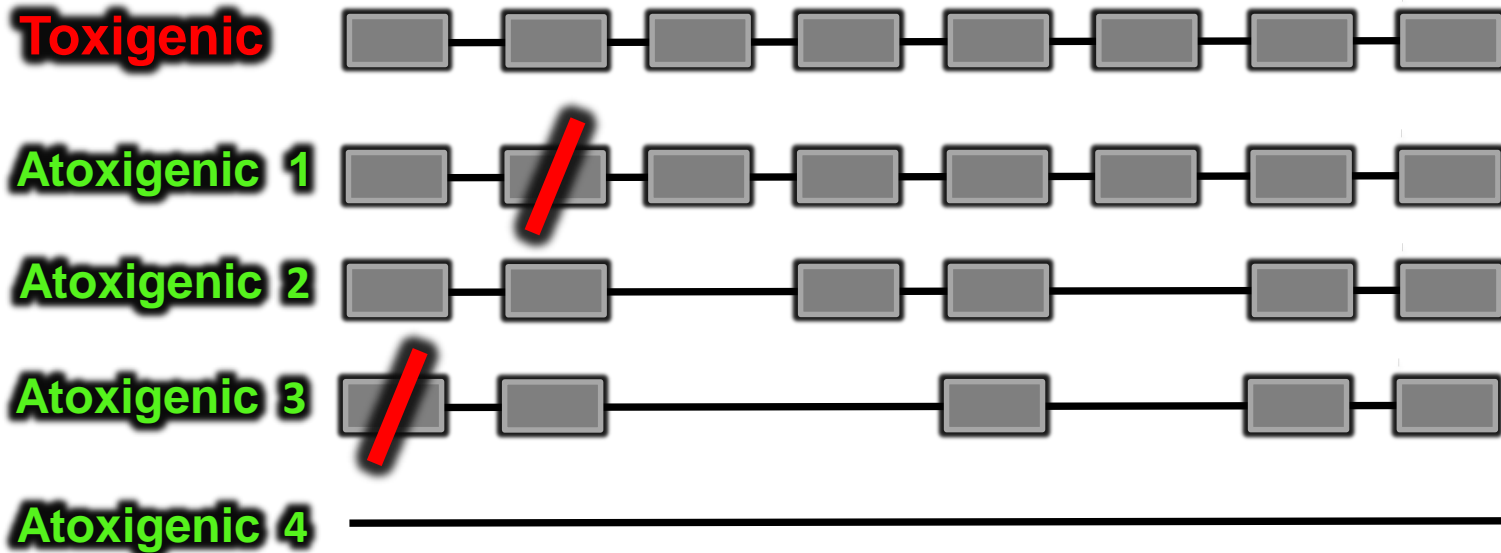


Survey map of Ghana

Maize = 326 samples
Groundnut = 183 samples
Isolates: > 5,000



Aflatoxin biosynthesis genes



Aflasafe GH01 (West Africa specific)			Aflasafe GH02 (Ghana specific)		
S/N	Genotype	Origin	S/N	Genotype	Origin
1	GHG079-4	Atebubu–Amantin	5	GHM511-3	Central Tongu
2	GHG083-4	Atebubu–Amantin	6	GHM109-4	Ejura–Sekyedumasi
3	GHG321-2	Nabdam	7	GMH001-5	Nsawam Adoagyiri.
4	GHM174-1	Wenchi	8	GHM287-10	Wa West

- ❖ EPA granted permit to evaluate efficacies of afla**safe** GH01 and afla**safe** GH02.
- ❖ Import permit granted for 52 tons of afla**safe** from IITA-Ibadan to Ghana for field evaluation trials.
- ❖ Action plan for inspection and monitoring of field trials set up with EPA.
- ❖ EPA updated on all activities relating to conduct of field trials.



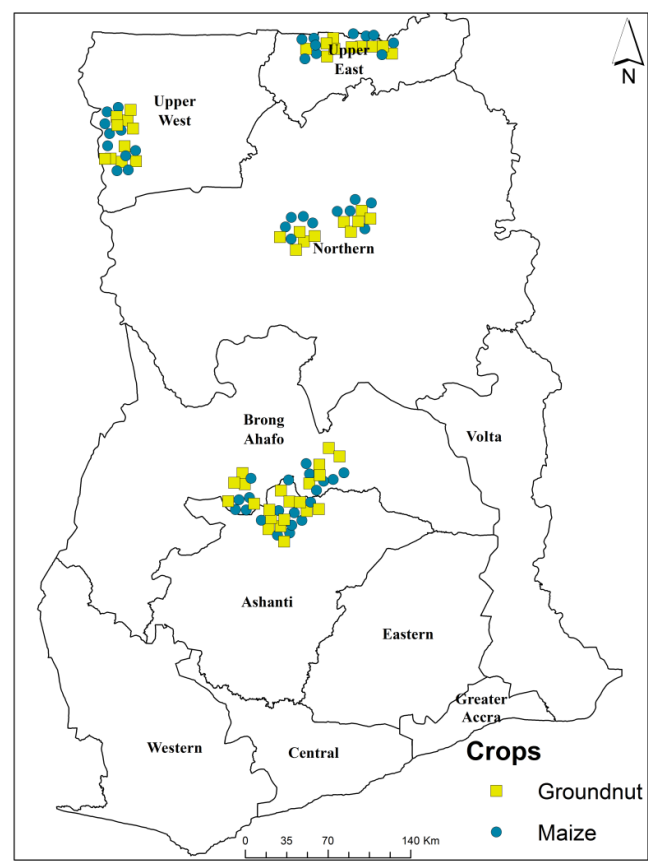
*EPA's Deputy Director, Pesticides division inspecting a consignment of afla**safe** (3 tons) at the EPA HQ in Accra*



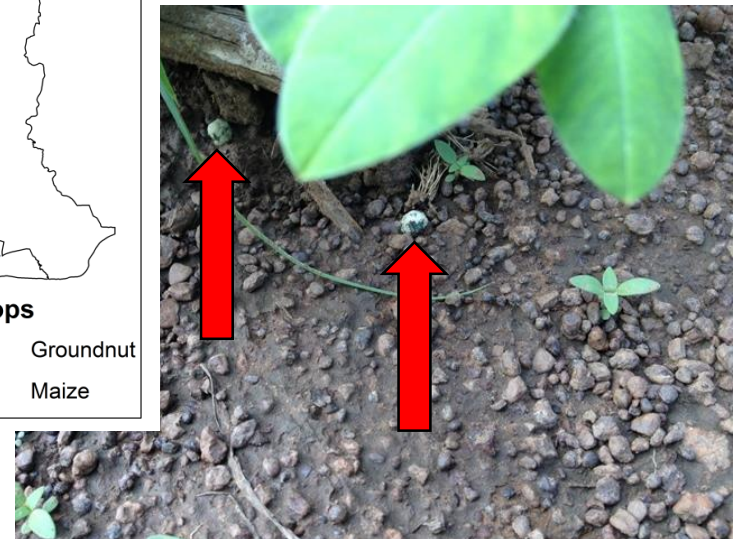
Training and sensitization



Field application



Crop sampling



Sporulation in aflasafe

Efficacy of aflasafe GH01

Aflatoxin concentration^y (ppb)

AEZ ^w	Region	Treatment ^x	Maize								Groundnut			
			Year 1		Year 2		Year 1		Year 2		Year 1		Year 2	
			Mean	% Red ^z	Mean	% Red ^z	Mean	% Red ^z	Mean	% Red ^z	Mean	% Red ^z	Mean	% Red ^z
DS	Brong Ahafo	Control	7.3 a	100	21 a	100	40 a	100	26 a	100	0 b	0 b		
		Treated	0 b		0 b		0 b		0 b		0 b			
	Northern	Control	98 a	100	238 a	100	2.8 a	100	199 a	100	0 b	0 b		
		Treated	0 b		0 b		0 b		0 b		0 b			
HF	Ashanti	Control	2.9 a	100	8.3 a	100	293 a	100	59 a	76	14 a	14 a		
		Treated	0 b		0 b		0 b		0 b		0 b			
	Brong Ahafo	Control	4.5 a	100	2.4 a	100	2.2 a	100	135 a	98	2.2 b	2.2 b		
		Treated	0 b		0 b		0 a		0 b		0 b			
SGS	Upper East	Control	4.7 a	100	122 a	100	13 a	99	200 a	100	0 b	0 b		
		Treated	0 b		0 b		0.1 b		0 b		0 b			
	Upper West	Control	6.3 a	100	301 a	98	53 a	99	939 a	100	0 b	0 b		
		Treated	0 b		6.0 b		0.3 b		0 b		0 b			

^w AEZ = Agroecological zones: DS = Derived Savanna, HF = Humid Forest, SGS = Southern Guinea Savanna.

^x Treated refers to fields to which biocontrol aflasafe product was applied. Control treatment refers to adjacent fields to which no aflasafe product was applied. ^y Mean of total aflatoxin concentration in grains samples from six fields/treatment/region.

^z % Red = $\{(\text{mean of control field} - \text{mean of treated field} / \text{mean of control field}) * 100\}$. Treatment means with the same letter are not significantly different according to Fisher's Least Significant Difference (LSD) test, $\alpha = 0.05$.

- ✓ Preparation & submission of dossier to EPA for approval and registration.
- ✓ Commercialization and large scale use of aflasafe by maize and groundnut farmers in Ghana.
- ✓ Programmatic Environmental Assessment (PEA) amendment for West Africa (Ghana).
- ✓ Develop an Environmental Mitigation and Monitoring Plan (EMMP) for aflasafe use in Ghana.
- ❖ Linking farmers to premium markets.

aflasafe production facility



Acknowledgements

BILL & MELINDA GATES foundation



MINISTRY OF
FOOD & AGRICULTURE
 REPUBLIC OF GHANA



Made Possible by Many National Partners in Ministries, KNUST, and on the Farm