AR-NAFAKA Project Aflatoxin Management: 2016–2017 Progress

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Africa RISING - NAFAKA Scaling Project End-of-project phase Review Meeting
Dar es Salaam, Tanzania, 3-4 July 2017

What is Aflatoxin

- Aflatoxin is a poison produced by Aspergillus spp.
- A. flavus and A. parasiticus
- Aspergillus is found in the soil and on dead & decaying organic matter
- Aflatoxin is colourless – can not be seen
- Grain with no visible signs of A. flavus can contain high amounts of aflatoxin
- Laboratory tests only way to determine presence of aflatoxins

Health Impacts of mycotoxins

- Toxicity of mycotoxins can be acute or chronic, and results in:
- Disorders in the digestive system
- Compromised gastrointestinal function, interfering with absorption of nutrients
- Deterioration of liver, renal or kidney function
- Immune suppression
- Cancer of the liver and oesophagus
- Birth defects and neural tube defects
- Impairment of child growth and development (stunting)
- Death – exposure to high doses

THE CITIZEN

IH370 wing part found anzania 'a vital clue' P. 3

thecitizen.co.tz Tuesday, 2 August 2016

PUZZLE Several critical questions remain unanswered after health crisis killed 14 people

Fresh queries about deadly food poison

The public is still largely uninformed about where exactly the cereals contaminated with deadly aflatoxins came from and how they entered the food chain.

STORY ON PAGE 2

PERTINENT QUESTIONS THAT NEED ANSWERS

1. Where did the cereals come from?
2. How did the cereals enter the food chain?
3. Are the cereals still in the market?
4. Are people still consuming the contaminated cereals?

19

THE CITIZEN

< Olomide: Enfant terrible of African music THE BEAT

thecitizen.co.tz Friday, 29 July 2016

REPORT Experts from the Ministry of Health are trying to establish whether the substance was from an animal or plant

Deadly food poison linked to 14 deaths in two regions

MORE INFO: HOW AFLATOXINS COME ABOUT

13

Deadly food poison linked to deaths in Dodoma, Manyara

Daily News, June 20, 16

your health

Aflatoxins: The invisible poison

THE PHARMACIST Dr Sajjad Gharatly Fazal

THE CITIZEN

Two districts on high alert after mystery illness kills 7

EPL fixtures serve up an enticing menu SPORTS EXTRA

Tanzania Daily News (Dar es Salaam) »

26 JUNE 20

Tanzania: Strange Disease Linked to Aflatoxin Poisoning

Tagged: East Africa • Health • Human Rights • Land and Rural Issues • Tanzania

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By Hilda Mhagama

As the number of patients who contracted the mysterious disease that ravaged parts of Chemba and Kondoa districts in

RELATED TOPICS

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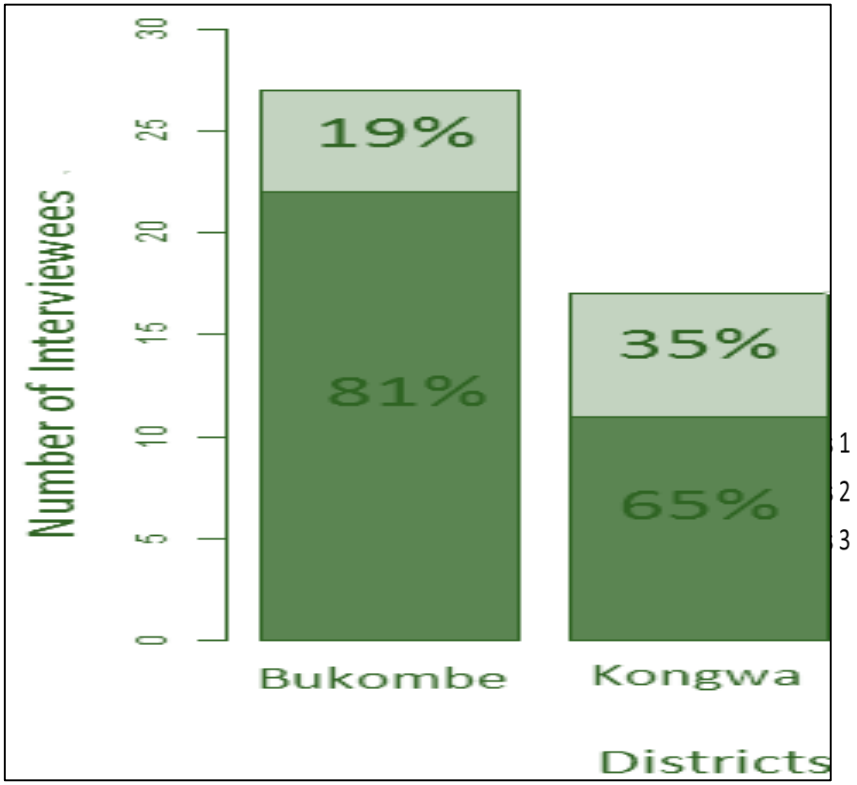
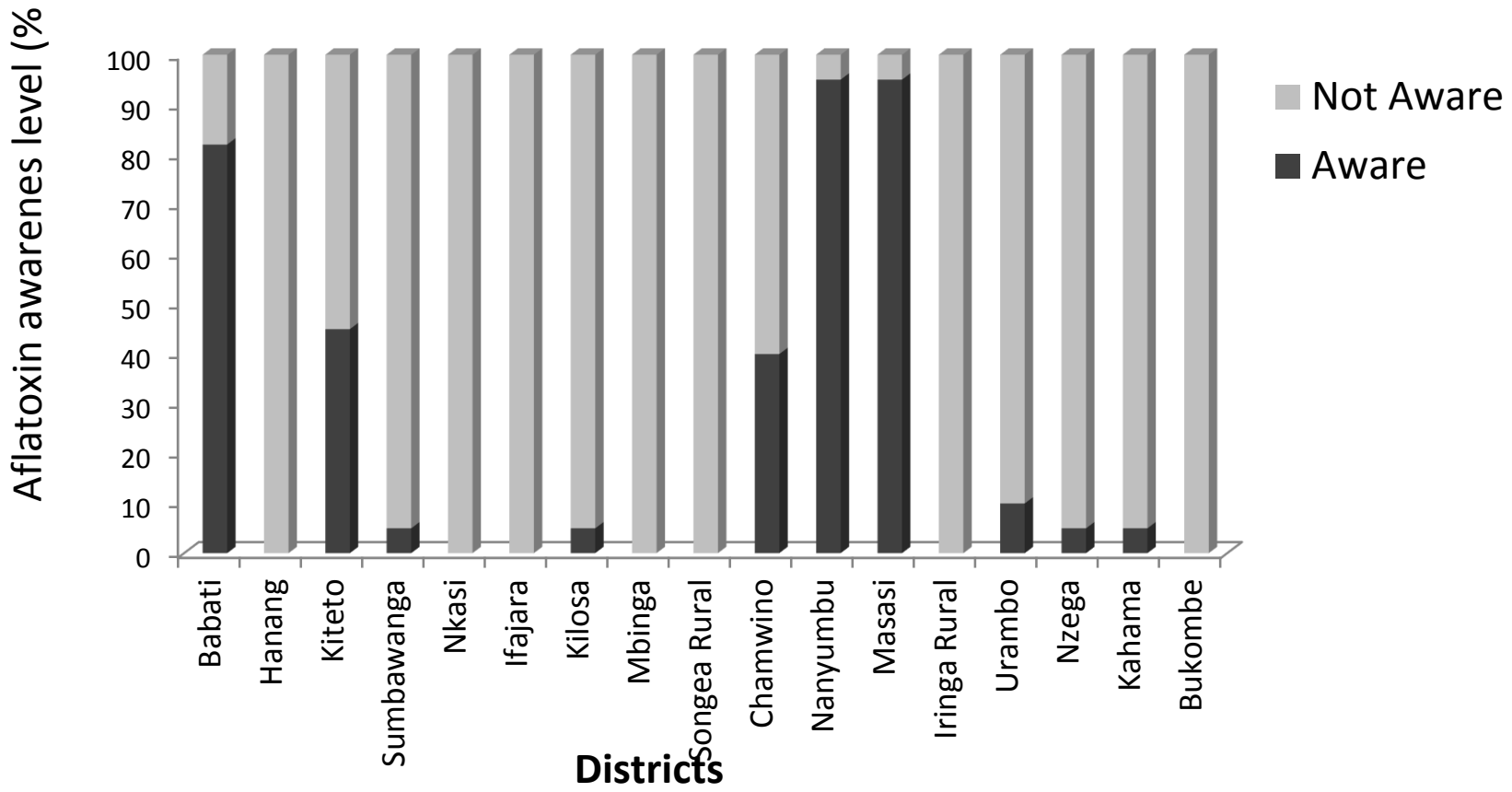
Symptoms

- Tanzania: 2016
  - 65 cases reported
  - 19 fatalities
  - Vomiting
  - Diarrhea
  - Swelling of abdomen
  - Yellowing of eyes

Mycotoxin Awareness is very low

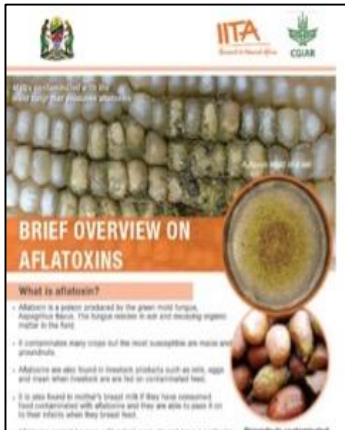


Aflatoxin awareness in Tanzania



Interventions

Awareness creation



Aflatoxins and health impacts

Interventions

Sensitization meetings

Group	Male	Female	Total
Government	139	38	177
Farmers	938	184	1122
Total	1077	222	1299

Chamwino

Kiteto

Kibaigwa

Farm field day (Kongwa)

Male	Female	Total
310	258	568

Media Familiarization Day

Male	Female	Total
24	14	38

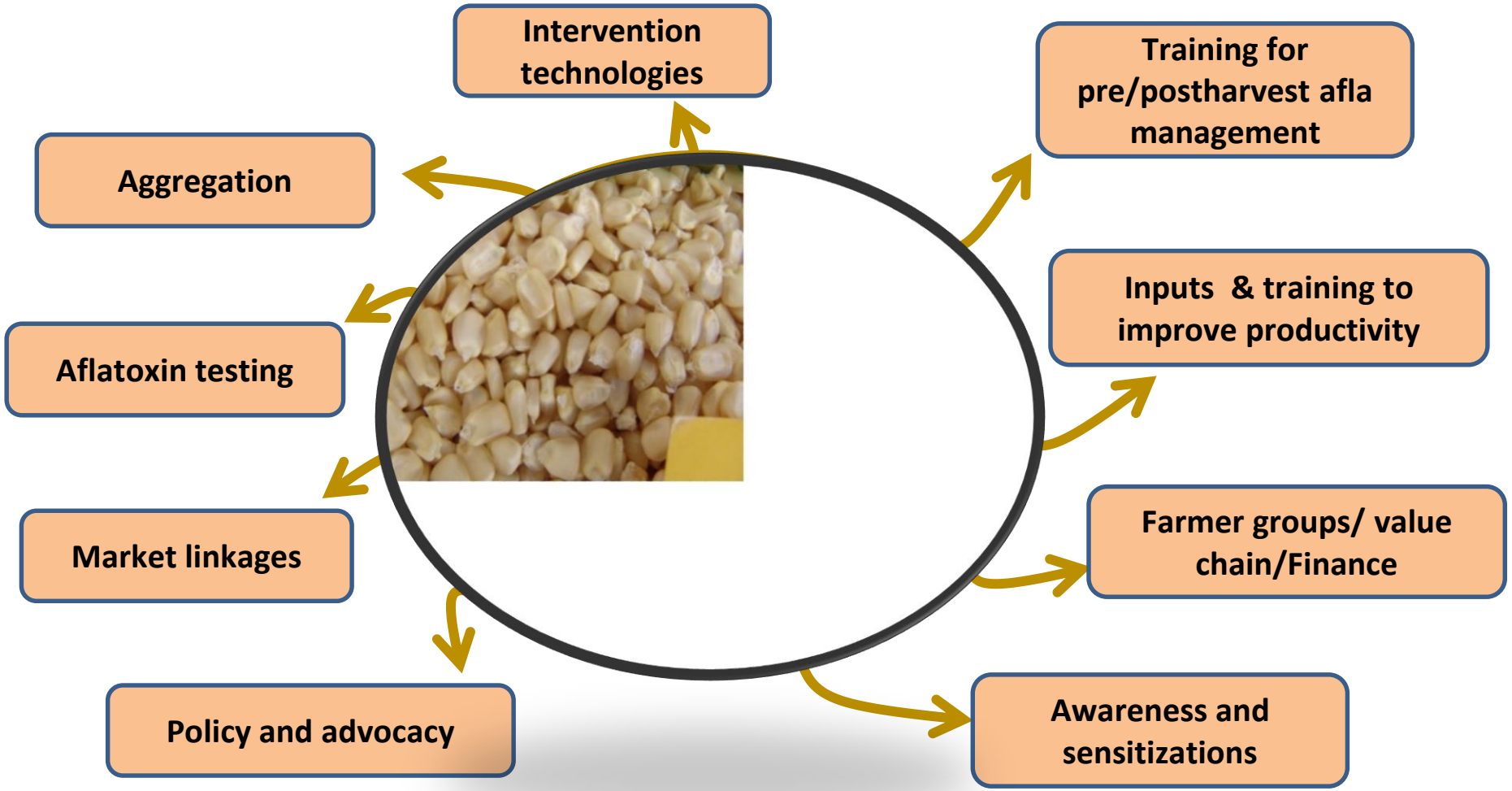
Aflatoxin management brochure

- Pre-testing

Group	Male	Female	Total
Government	24	3	27
Farmers	38	13	51
Total	62	16	**78**

- Finalizing brochure (put a photo of brochure here. Take a screen short)

Integrated approach to manage aflatoxins

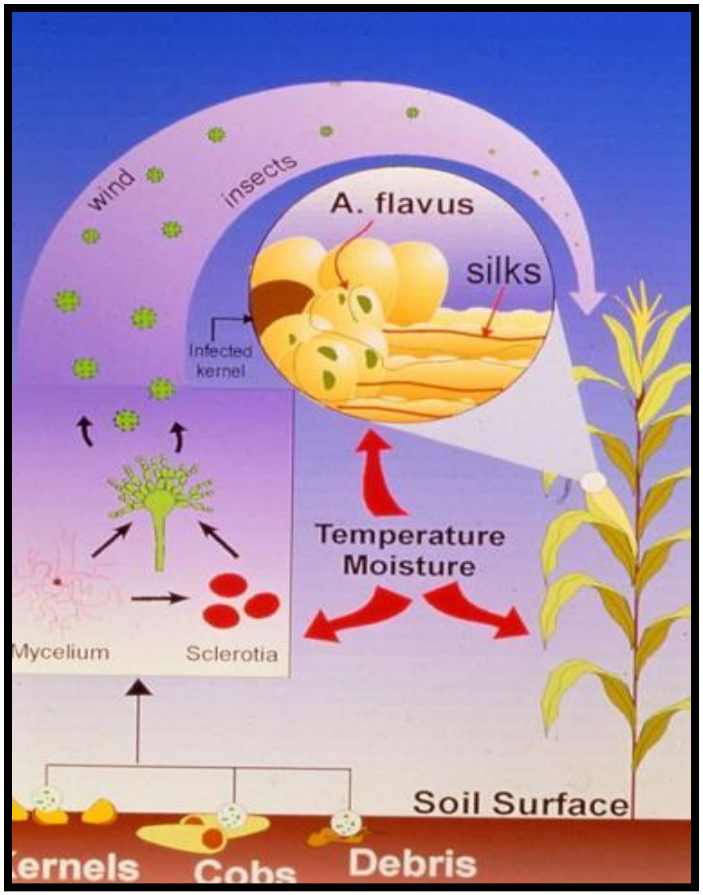


Interventions testing

- Aflatoxin bio-control
  - Conducted aflatoxin biocontrol trails
  - Use of Aspergillus flavus strains that do not produce toxins
  - Naturally outcompete the toxic producing strains, reducing their population and hence aflatoxin
- 4 Regions
  - Manyara
  - Dodoma
  - Mtwara
  - Morogoro

Aspergillus flavus life cycle

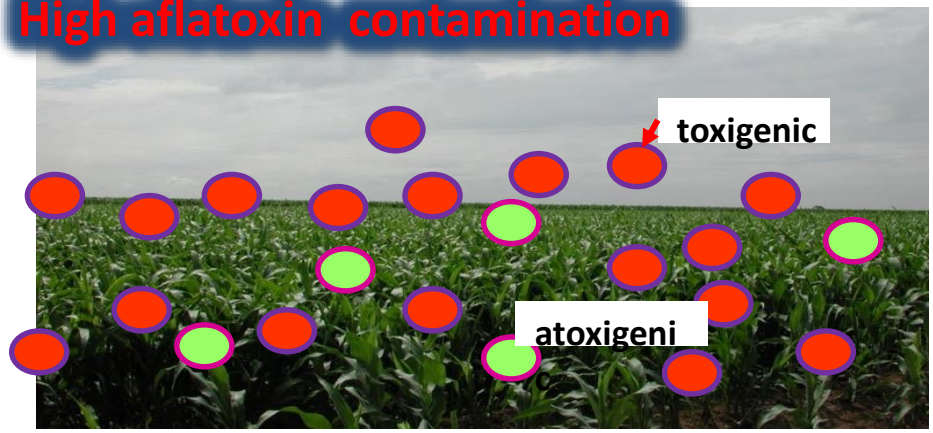
Atoxigenic strains will reach maize, instead of toxigenic strains = reduced aflatoxin contamination



Competitive exclusion

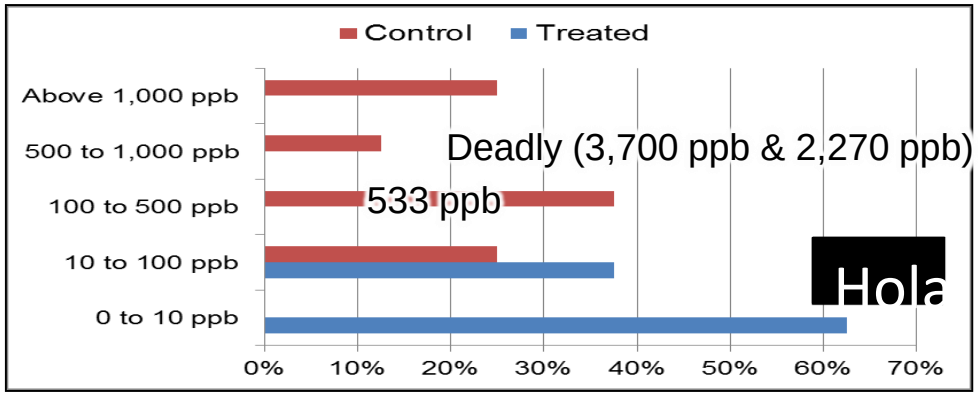
Non treated Field

High aflatoxin contamination



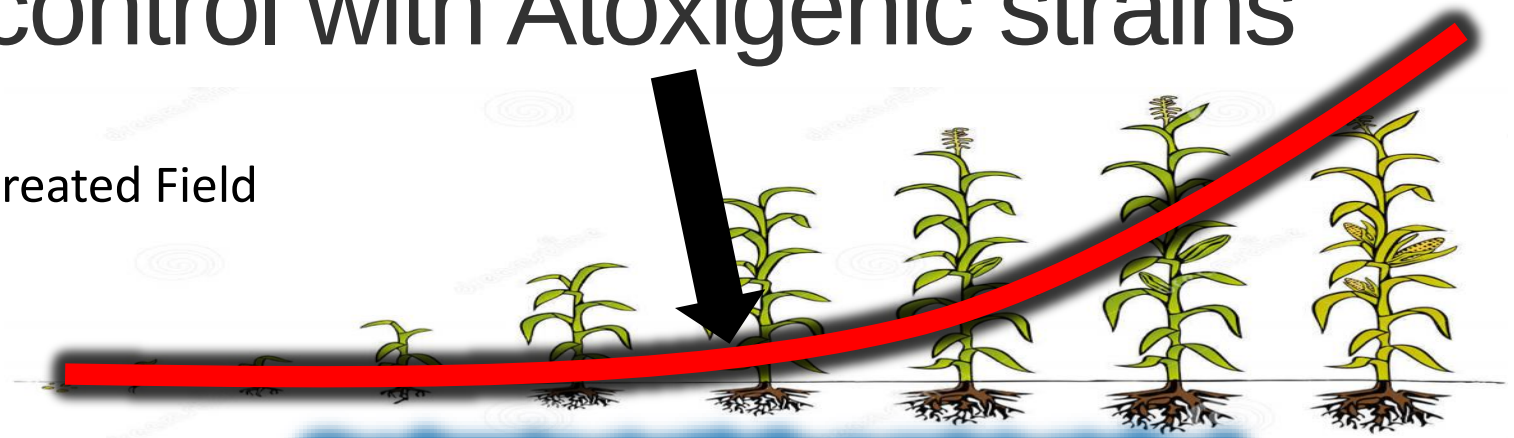
Treated Field

Little to No aflatoxin contamination



Biocontrol with Atoxigenic strains

Non-treated Field



Crop fungal content is the same in treated and untreated fields

Aflatoxin reduced by >80%

Treated Field

Aflasafe Development

	Aflasafe TZ01 (Region-specific)		Aflasafe TZ02 (Tanzania specific)	
S/N	**Isolate**	**Haplotype**	**Isolate**	**Haplotype**
1	TMS199-3	BOWAGA	TMS64-1	BOHAMA
2	TGS364-2	BOHIYA	TGS55-6	BAQARA
3	TMH 30-8	BOHOCO	TMS205-5	BAQEDA
4	TMH104-9	BOPAJI	TMS137-3	BOHAJU


Sterilizing sorghum

Aflasafe efficacy results 2016

Region	District	Crop	Treatment	Mean Aflatoxin (ppb)	Reduction (%)
Morogoro	Kilosa	Maize	Treated	1.4	51.8
			Control	2.9	
	Kilombero	Maize	Treated	0.5	95.6
			Control	11.9	
Manyara	Babati	Maize	Treated	1.9	77.7
			Control	8.5	
Dodoma	Mpwapwa	Groundnut	Treated	145.8	57.3
			Control	341.4	
	Kibaigwa Township	Maize	Treated	2.2	75.8
			Control	9.1	
Mtwara	Masasi	Groundnut	Treated	21.9	94.6
			Control	401.0	
	Nanyumbo	Groundnut	Treated	57.4	82.5
			Control	326.8	

Aflasafe Trials - 2017

Region	District	Number of Trails	Observation
Songwe	Mbozi (M)	20	Not Treated
Dodoma	Mpwapwa (G)	30	4 fields same of 2016 season
	Kongwa (G)	12	
	Kongwa (M)	20	
	Kiteto (M)	20	
	Kondoa (M)	20	
	Chemba (M)	20	
	Chiamwino (M)	20	
	Kibaigwa (M)	20	10 treated in 2017 and 10 from 2016
Morogoro	Kilosa (M)	30	4 fields same of 2016 season
	Kilombero (M)	30	4 fields same of 2016 season
Mtwara	Masasi (G)	26	
	Nanyumbo (G)	26	
Total		294	

Way Forward

- Aflatoxin sensitization meetings (Iringa rural, Kilolo and Vbomero districts)
- Media training workshop (Dare s Salaam and Morongoro) – July 17-21
- Printing and dissemination of bronchure
- Afaltoxin analysis for efficacy trails
- Microbial analysis
- Finalize registration dossier and Aflsafe registration

Challenges

- Registration of Aflasafe – wide scale dissemination not possible if not registered
- Drought – the year started very late, so all activities were delayed.

Meeting the targets

Indicator	Target	Number reached
4.5.2(2) Number of hectares under improved technologies or management practices as a result of USG assistance	200 ha	294
4.5.2(5) Number of farmers and others who have applied new technologies or management practices as a result of USG assistance	200 plots	294
4.5.2 (7) Number of individuals who have received USG supported short-term agricultural sector productivity or food security training	15,000	-
4.5.2 (11) Number of food security private enterprises (for profit), producers organizations, water users associations, women's groups, trade and business associations, and community-based organizations (CBOs) receiving USG assistance	200	2,140 (1,530 male: 613 female)
4.5.2 (13) Number of rural households benefiting directly from USG interventions	15,000	-

Partnerships

ARI- Naliendele
Mycotoxin steering committee
USDA – ARS
Farmers
DAICOs
Ministry of Agriculture
Africa RISING
NMIST
NAFAKA
Private sector

Financial support –
USAID
USDA-FAS
Bill & Melinda Gates Foundation

Snap shot of activities

Aflasafe production for 2017 season

- 4 tons for Zambia
  - 2 tons Aflasafe ZM01
  - 2 tons Aflasafe ZM02
- 3 tons for Malawi
  - 1.5 tons Aflasafe MW01
  - 1.5 tons Aflasafe MWMZ01
- 4 tons for Mozambique
  - 2.5 tons Aflasafe MZ01
  - 2.5 tons Aflasafe MWMZ01
- 4 tons Aflasafe Tanzania
  - 2 tons Aflasafe TZ01
  - 2 tons Aflasafe TZ02
- Quality control (QC) positive!

Africa Research in Sustainable Intensification for the Next Generation

africa-rising.net