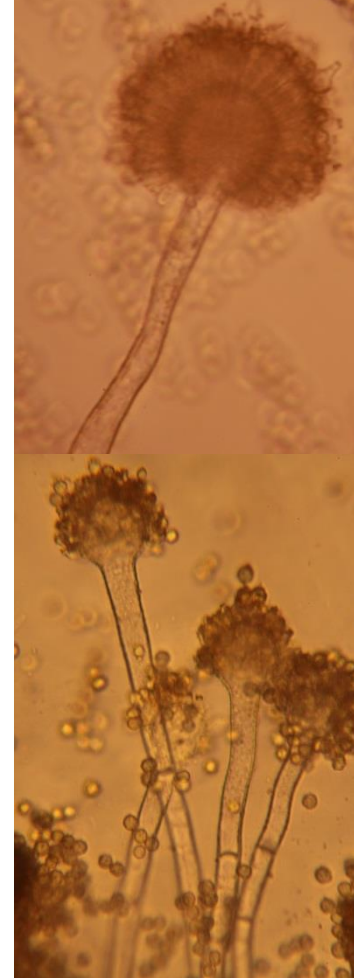


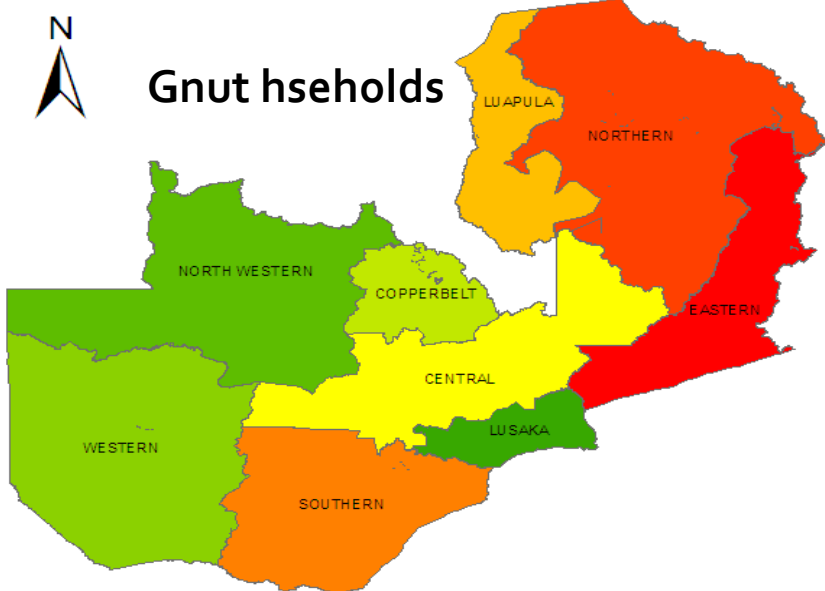
Aflatoxin mitigation: The Zambian case study

Sam Njoroge, ICRISAT, Malawi

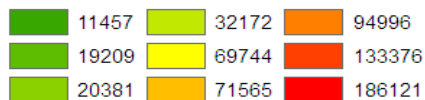




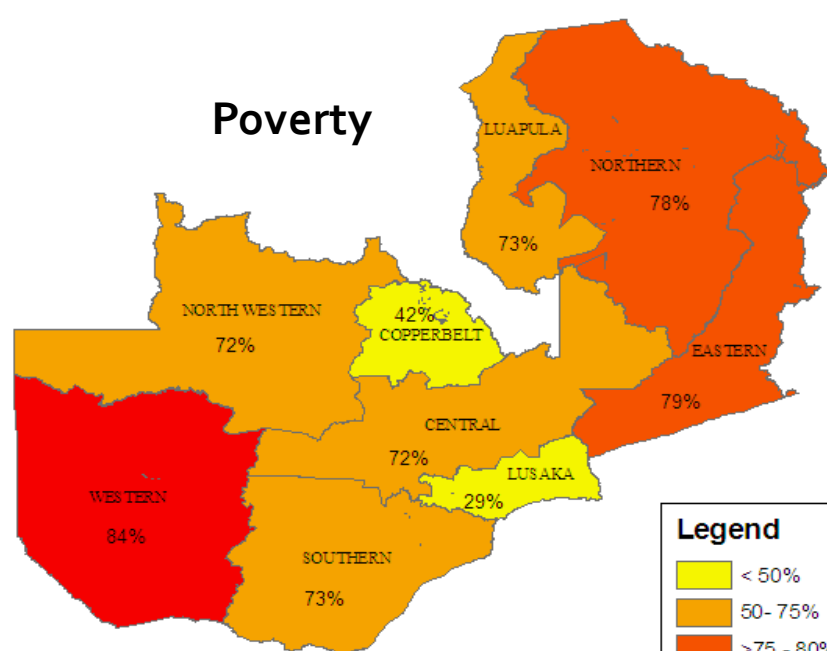
Gnut hseholds



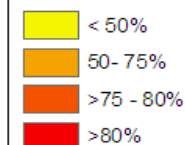
Legend



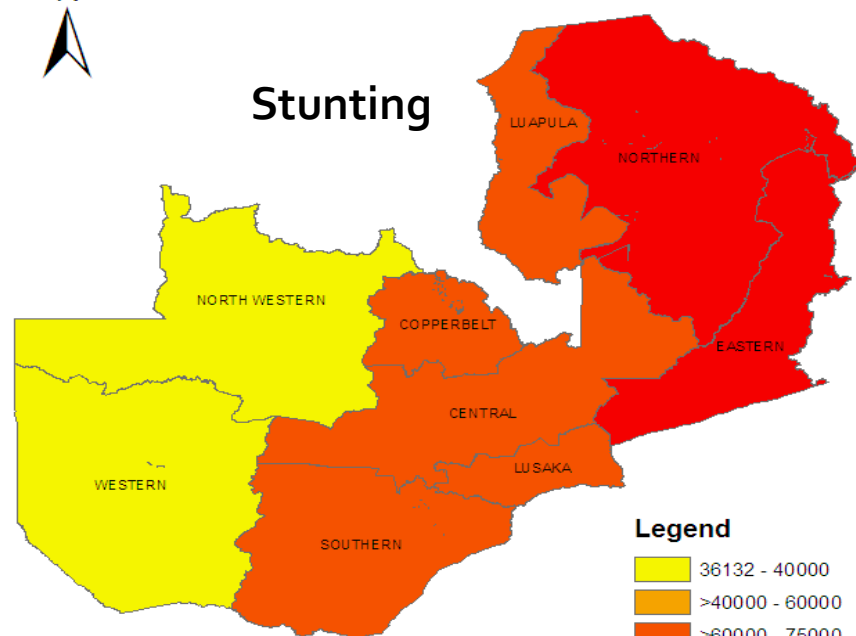
Poverty



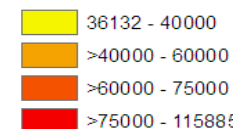
Legend



Stunting



Legend



Limits for Aflatoxin (total) Allowable in Foodstuffs

• Australia	0.02 to 1
• Germany	5
• India	30
• Mexico	20
• UK	10
• USA	20
• Malawi (P_butter)	3
• South Africa	10



Aflatoxin B₁ (ppb) after harvest in 2012, Eastern Zambia

	PET	NYI	CHI	MAM
0-4	21	15	43	38
>4 to 20	41	50	32	31
>20 to 100	30	23	23	26
>100 to 1000	7	9	5	-
>1000	1	3	1	-
N	100	100	104	95
Maximum	3,258	4,980	1,077	69
Arithmetic mean	0.9	1.1	0.8	0.7



Aflatoxin B₁ (ppb) at harvest in 2013, Eastern Zambia (Sorted)

	CHIPATA	KATETE	MAMBWE
0-4	93	8	64
>4 to 20	41	3	24
>20 to 100	5	1	6
>100 to 1000	9	1	1
>1000	0	0	0
N	148	13	95
Maximum	400	506	200
Arithmetic mean	0.55	0.67	0.50



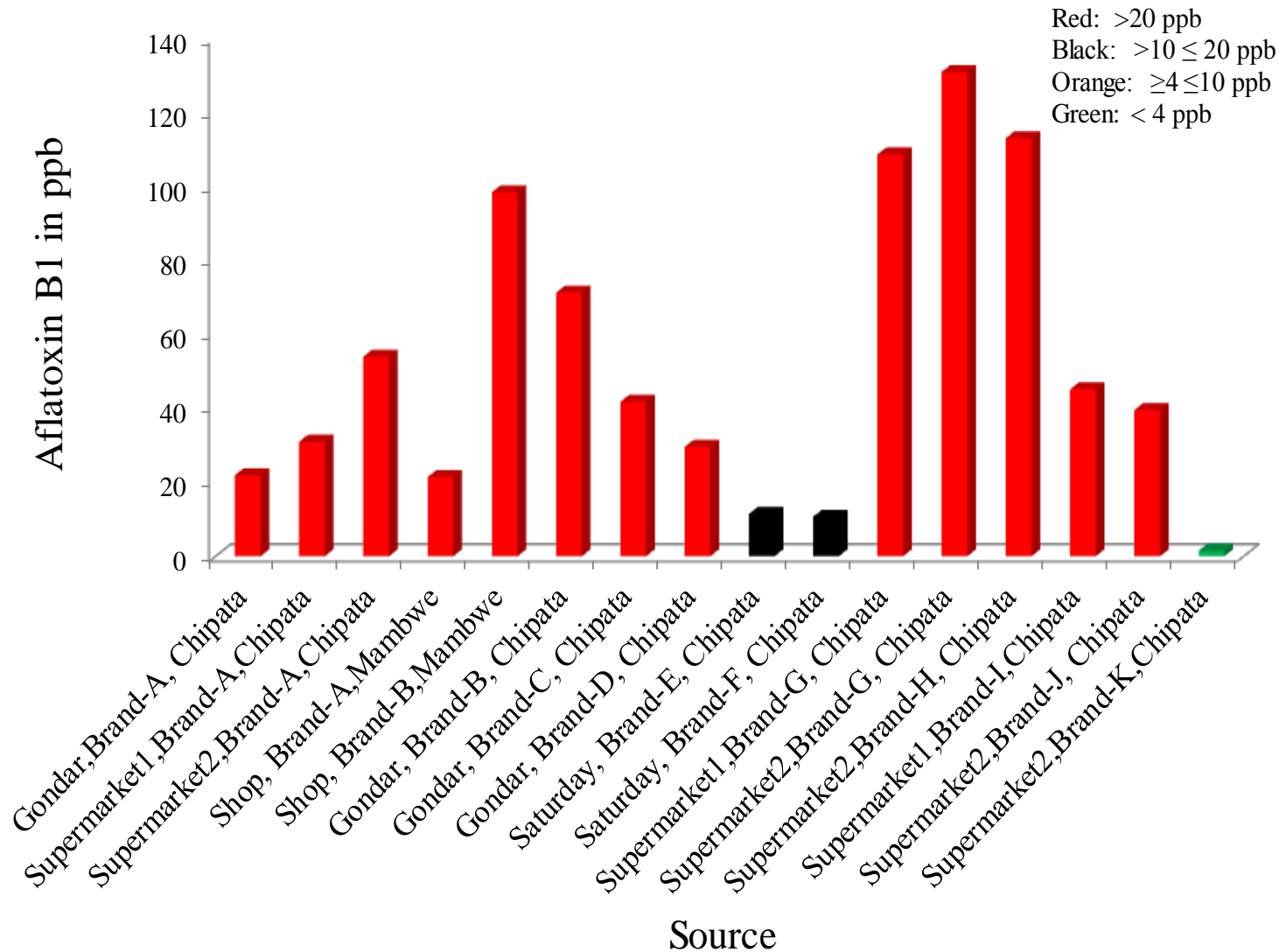
Aflatoxin B₁ (ppb) at harvest in 2013, Eastern Zambia (Sort-outs)

	CHIPATA	KATETE	MAMBWE
0-4	30	2	34
>4 to 20	40	3	11
>20 to 100	28	3	18
>100 to 1000	43	3	29
>1000	7	2	3
N	148	13	95

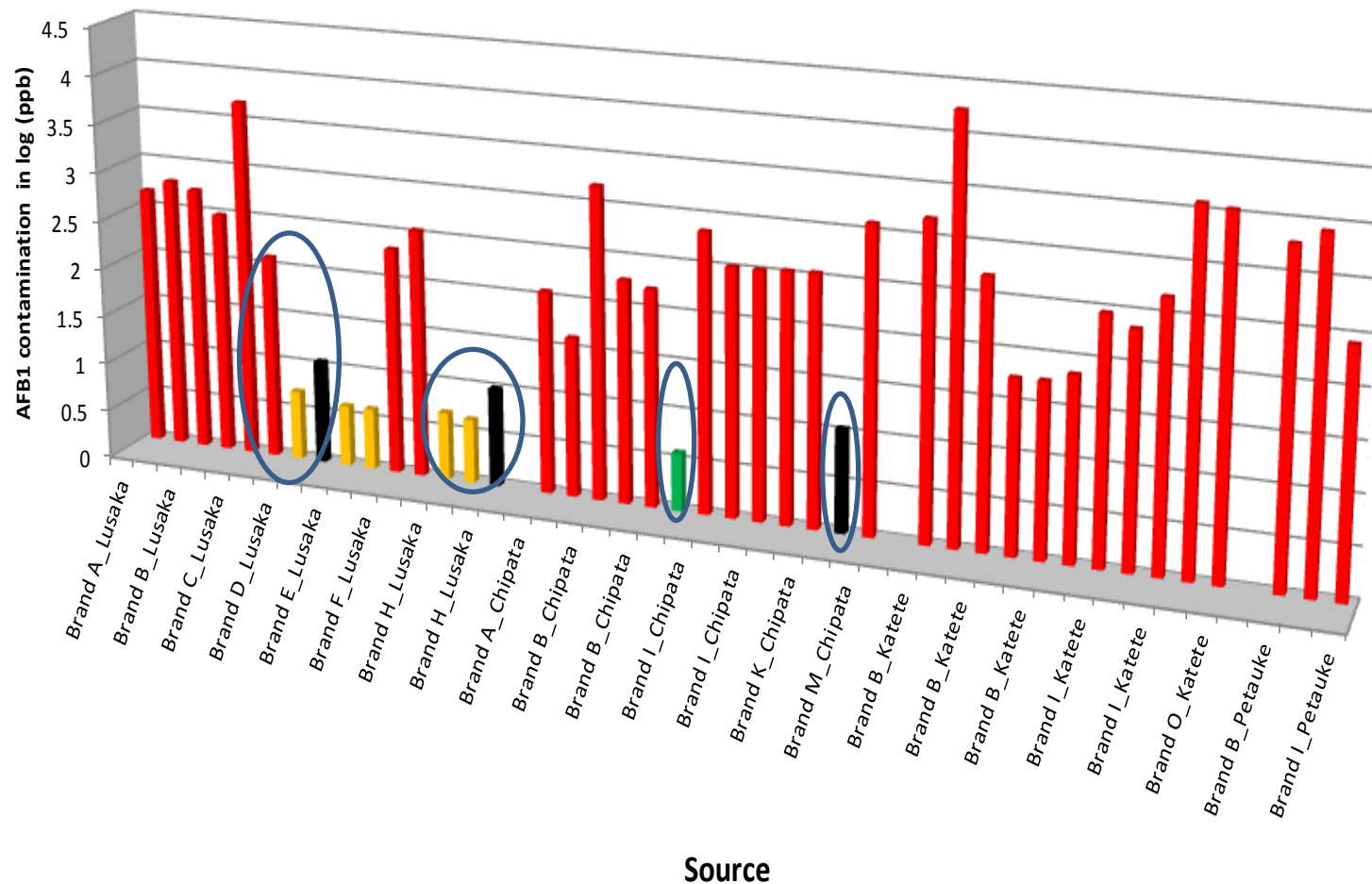
Maximum	3,235	1,039	1,900
Arithmetic mean	1.57	1.74	1.33



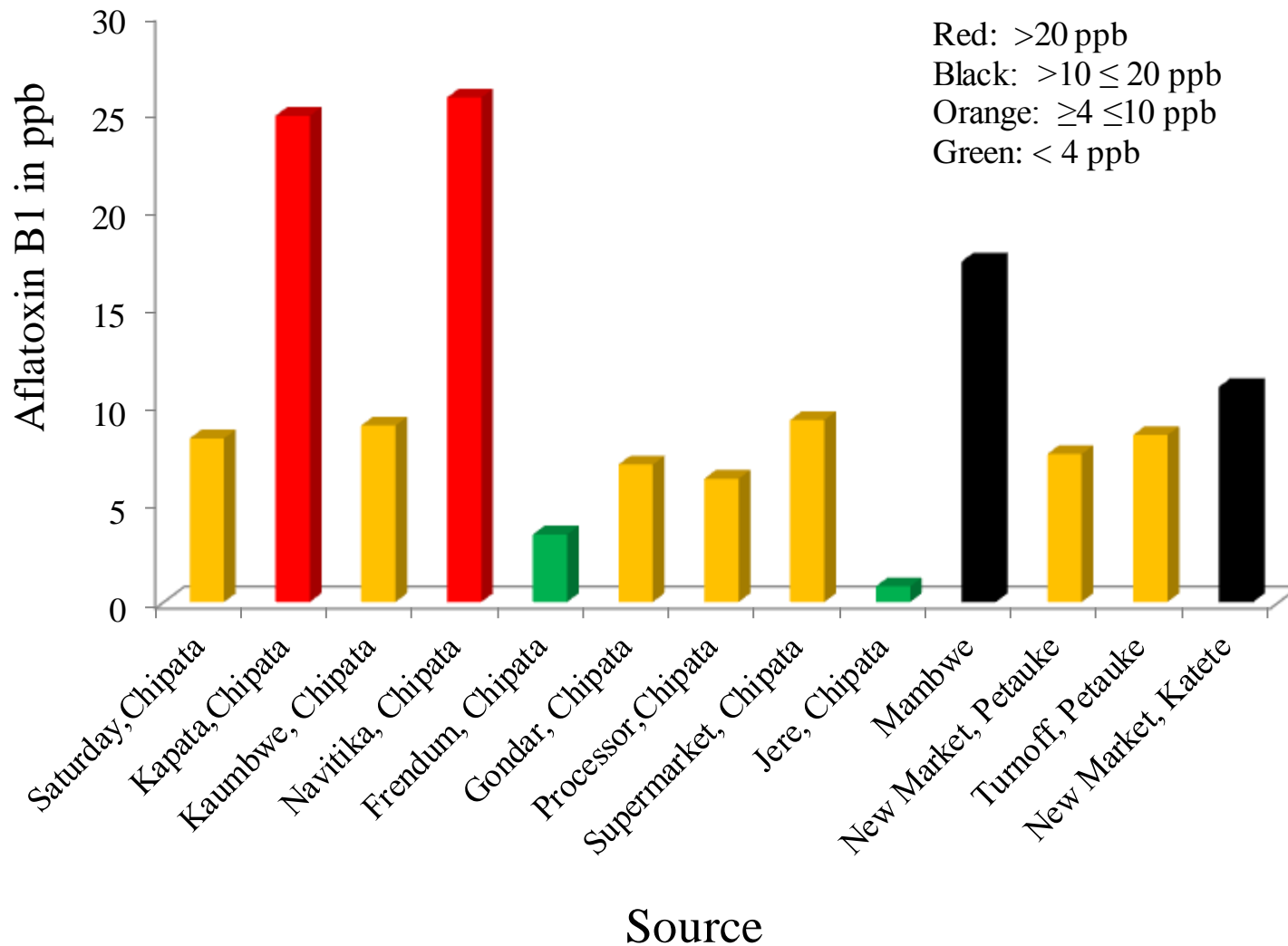
Mean aflatoxin B₁ in peanut butter, Eastern Zambia in 2012



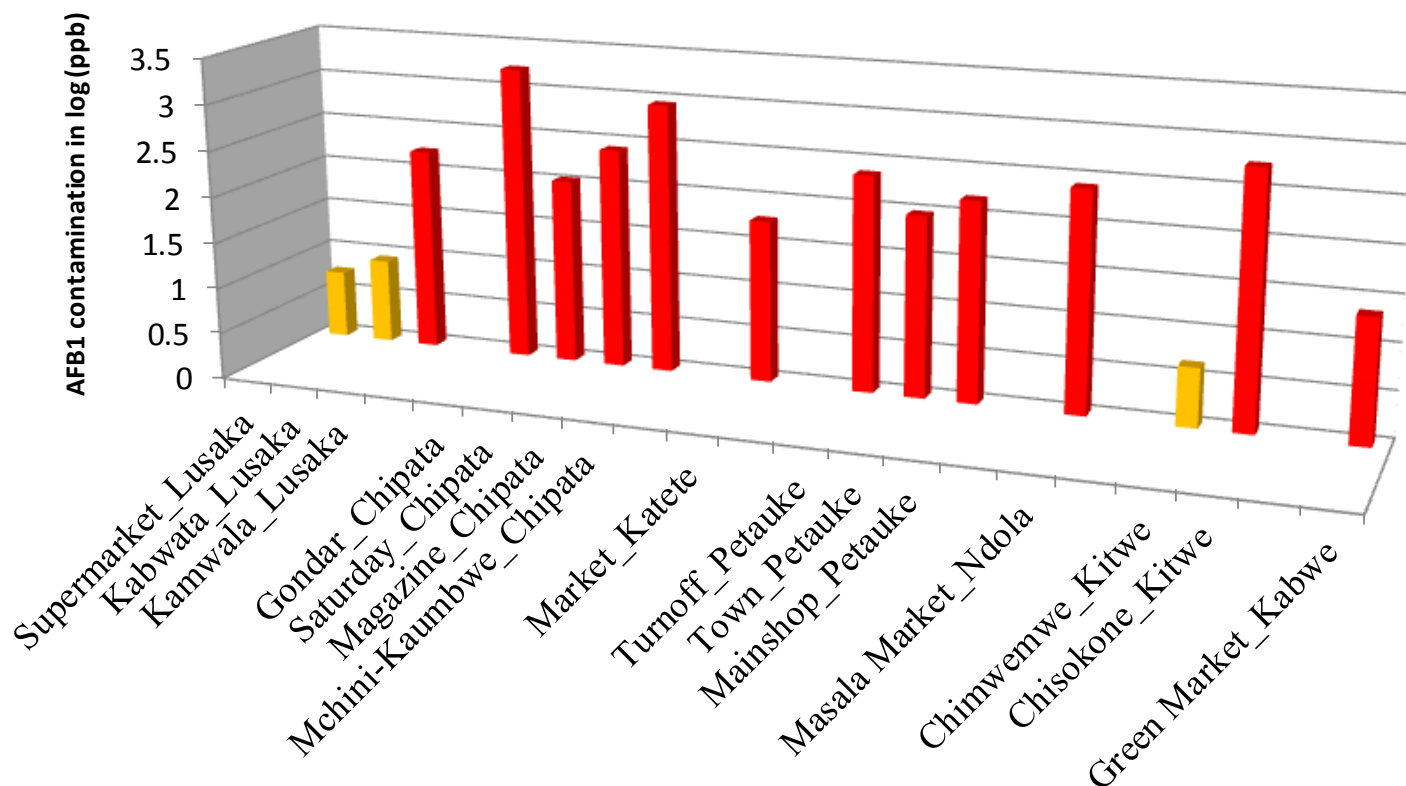
Mean aflatoxin B₁ in peanut butter in 2013, Zambia



Mean aflatoxin B₁ in market groundnut grain in 2012, Eastern Zambia



Mean aflatoxin B₁ in market groundnut grain in 2013, Zambia



Source

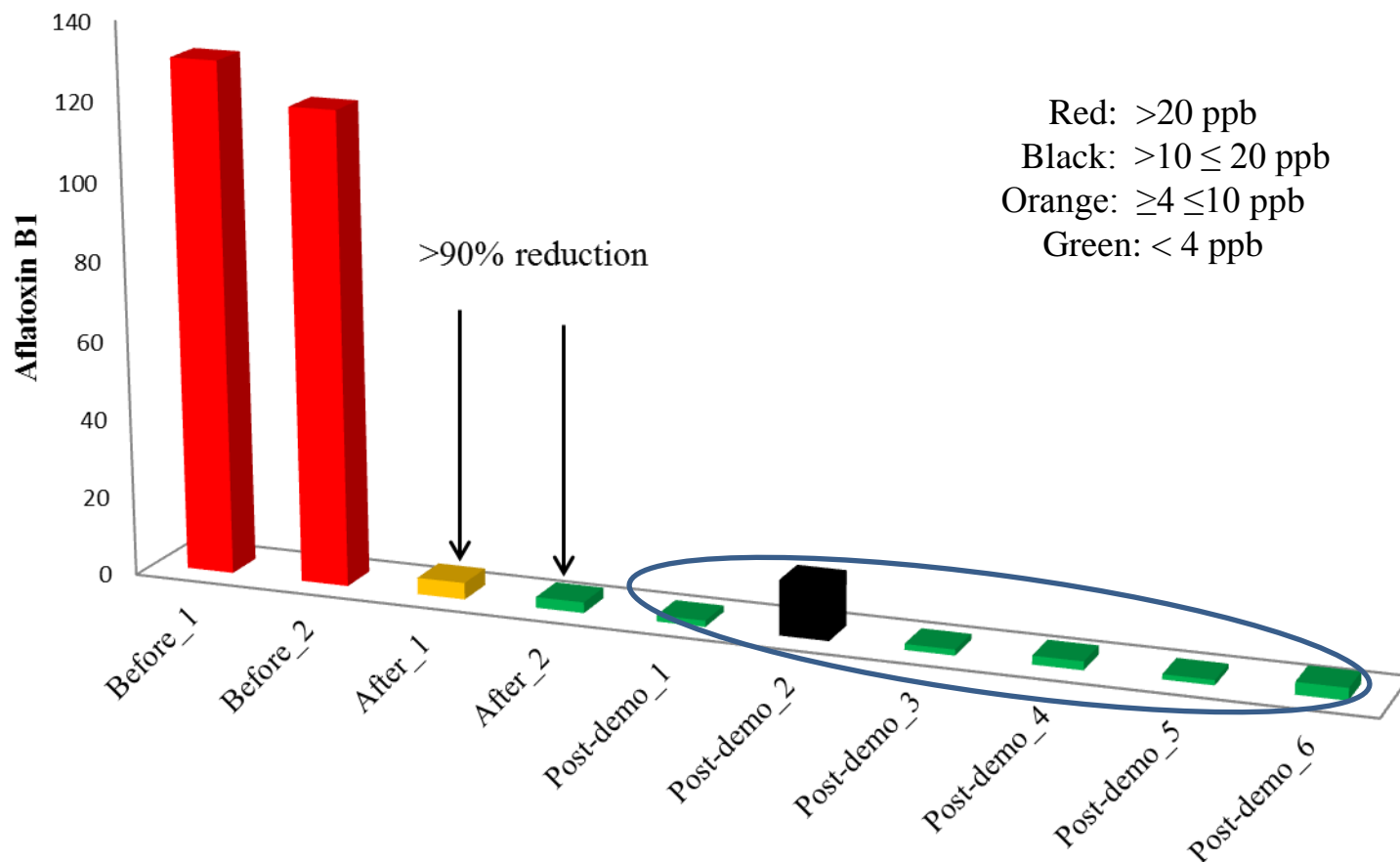


On-going work

- **Crop rotation** (Zambia and Malawi)-
Maize, cotton, sunflower, groundnuts,
millet, sorghum, pigeonpea
- **Amendment** (Gypsum, Biochar)
- **Modeling** (49 to 21 days before harvest)-
Zambia and Malawi)
- **Sorting/Alternative uses**
- **Characterize fungi in sect. *Flavi***
- **Dissemination/communication..catalyzi-
ng change**



Effect of grading on aflatoxin contamination, EPFC



Aflatoxin B₁ (ppb) at harvest in 2013, Eastern Zambia (Sort-outs)

	CHIPATA	KATETE	MAMBWE
0-4	30	2	34
>4 to 20	40	3	11
>20 to 100	28	3	18
>100 to 1000	43	3	29
>1000	7	2	3
N	148	13	95
Maximum	3,235	1,039	1,900
Arithmetic mean	1.57	1.74	1.33



Fate of contaminated nuts...

- Oil
- Feed
- Fertilizer
- Blending
- Binding (NovaSil clay)
- Blanching

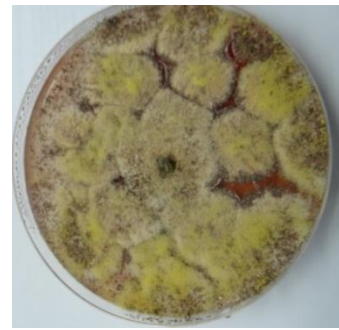




Czapek

Aspergillus parasiticus

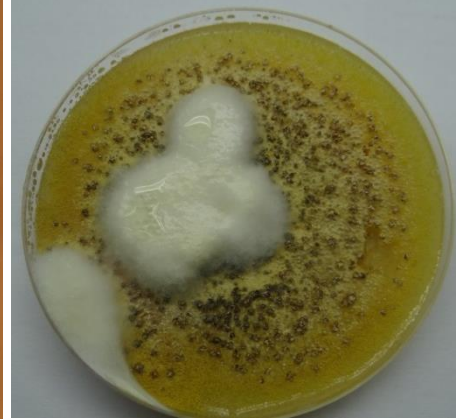
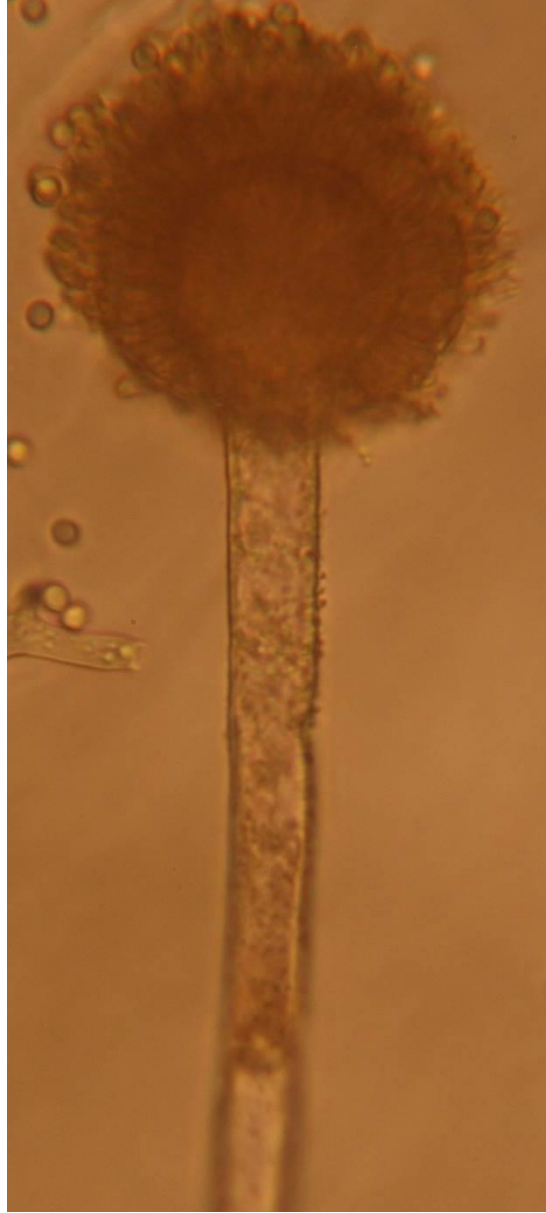
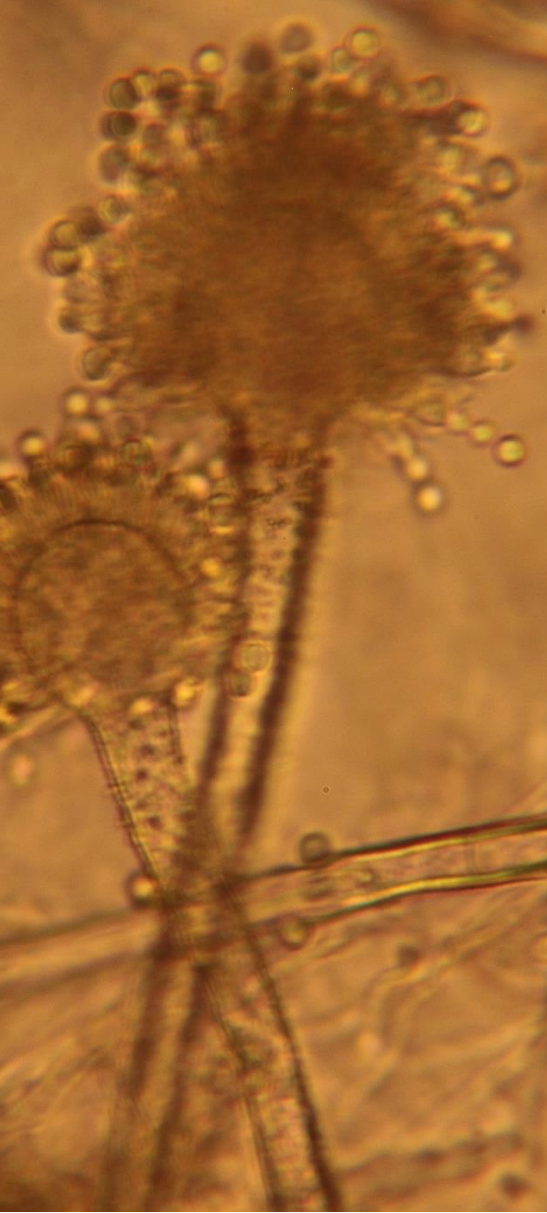




Czapek

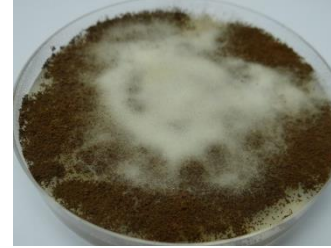
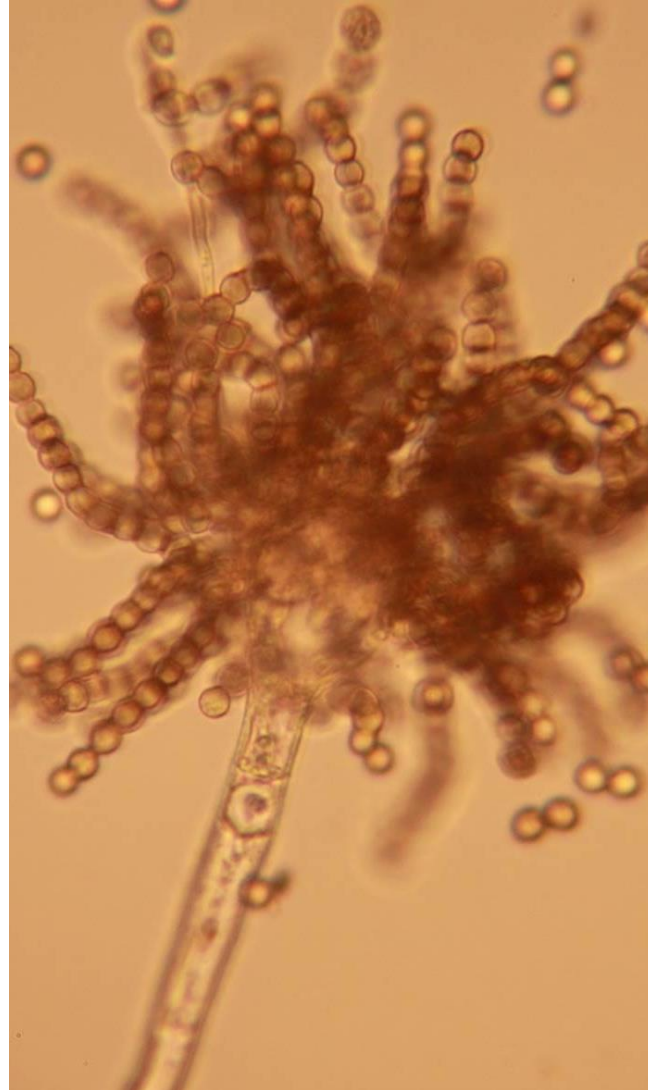
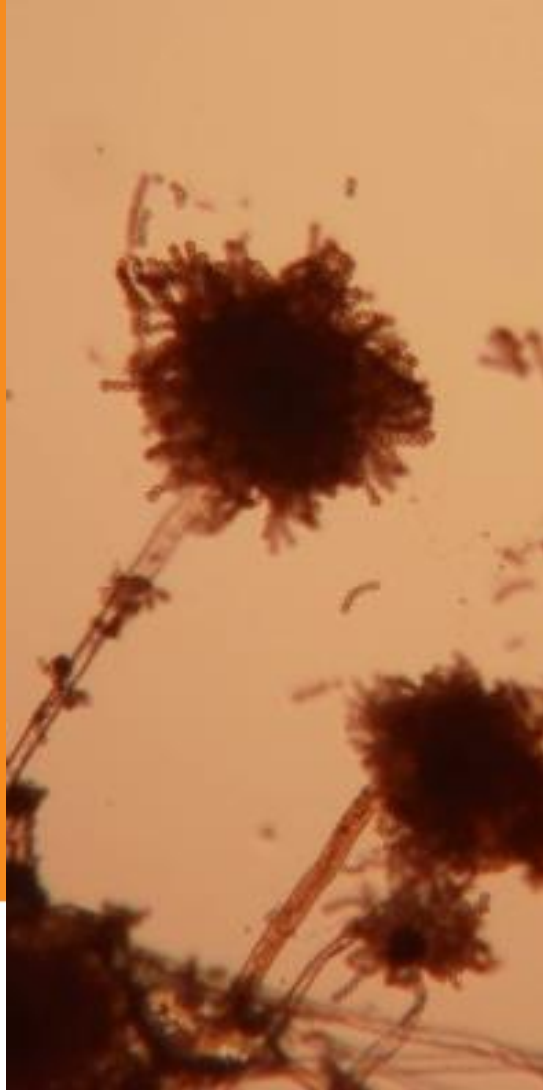
Aspergillus flavus



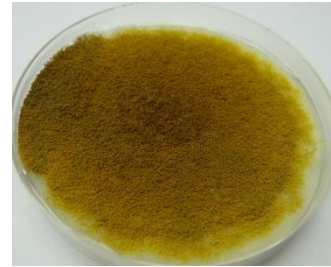


Czapek

Aspergillus nomius



Czapek

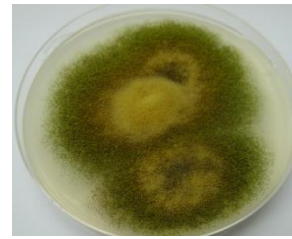
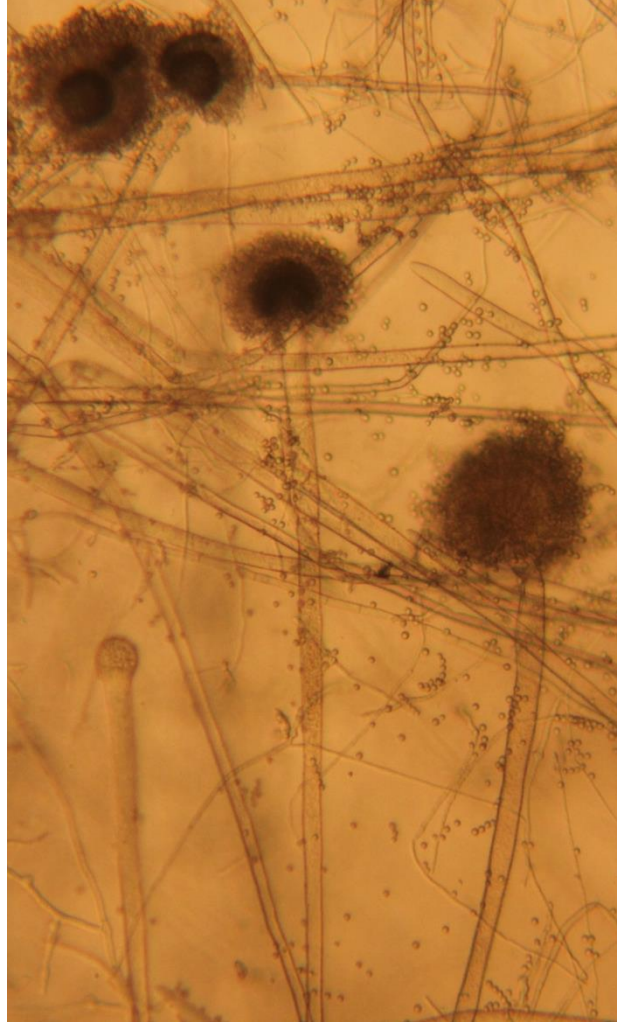
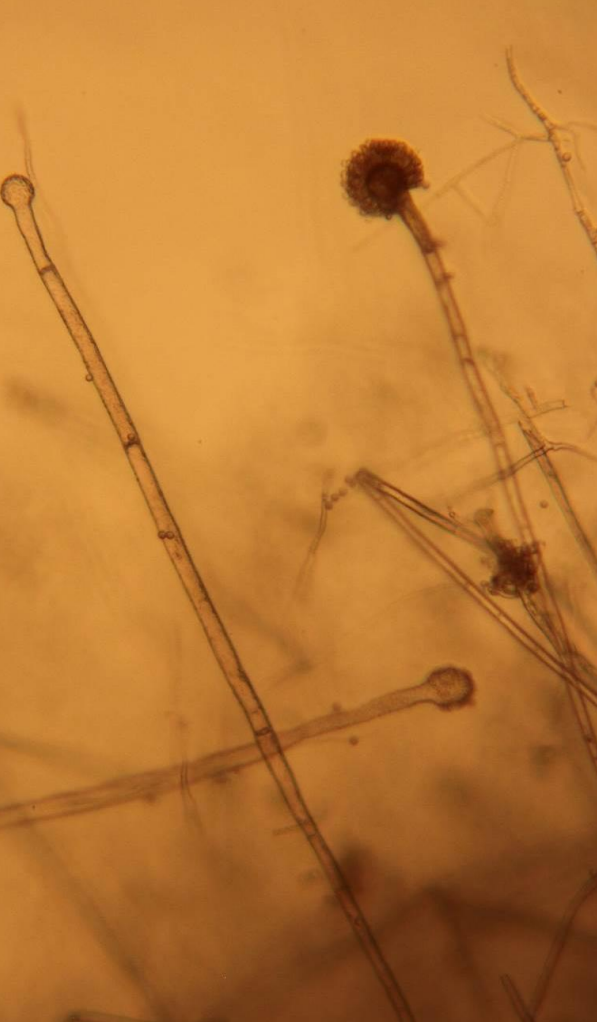


Czapek

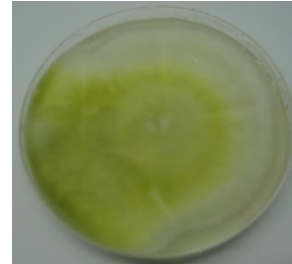


MEA

Aspergillus tamaris



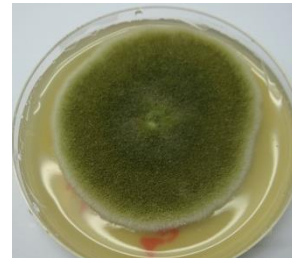
Czapek



Czapek



MEA



MEA

Aspergillus oryzae

This work has
been undertaken
as part of the



RESEARCH
PROGRAM ON
GrainLegumes



RESEARCH
PROGRAM ON
Agriculture for
Nutrition
and Health



FEED THE FUTURE
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ICRISAT is a member of the CGIAR Consortium