



REVIEW OF AFLATOXIN RESEARCH IN KENYA: NARS (KARI) PERSPECTIVE

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Outline

- NARS in Kenya
- KARI
- Aflatoxins problems
- What has NARS/KARI Done
 - Past research
 - Ongoing research
 - Way forward
 - Photos



NARS in Kenya

- In Kenya, agric research is undertaken by public research institutions and private sector institutions
- These institutes comprise the National Agricultural Research Systems (NARS)
- Major public agric research institutes:
 - KARI, KEMFRI, KIRDI, CRF, TRFK, KESREF
- Universities – mainly UoN, Moi, Egerton, JKUAT
- Private sector e.g. KBL and seed companies



KARI

- KARI is Kenya's principal national research institution
- Its responsible for research and technology generation on crops, livestock, soil and water management and socioeconomics
- Falls under the ministry of Agriculture

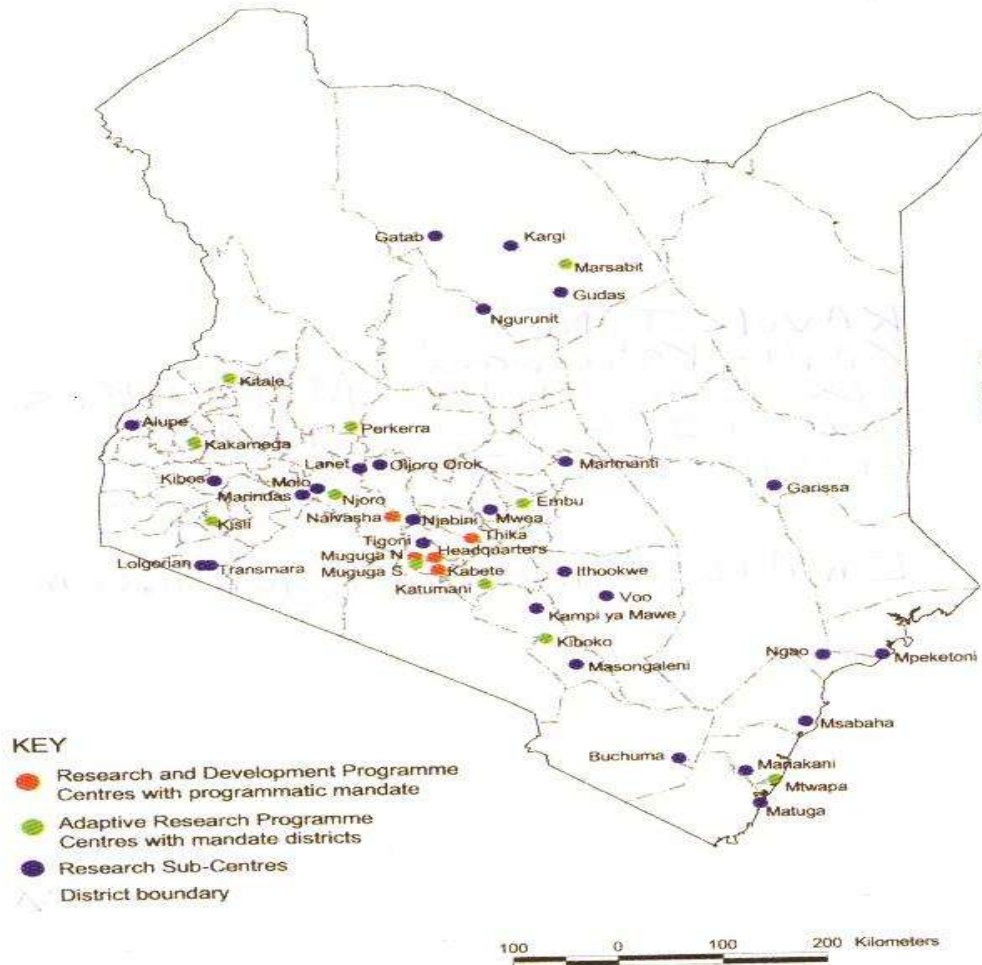


KARI PARTNERS

- CGIAR'S: CIMMYT, ICRISAT etc
- Universities: Local and international
- Government ministries and parastatals e.g. MOA, KEPHIS, KIRDI etc
- Regional organizations e.g. ASARECA
- Non-governmental organizations (NGOs)
- Etc

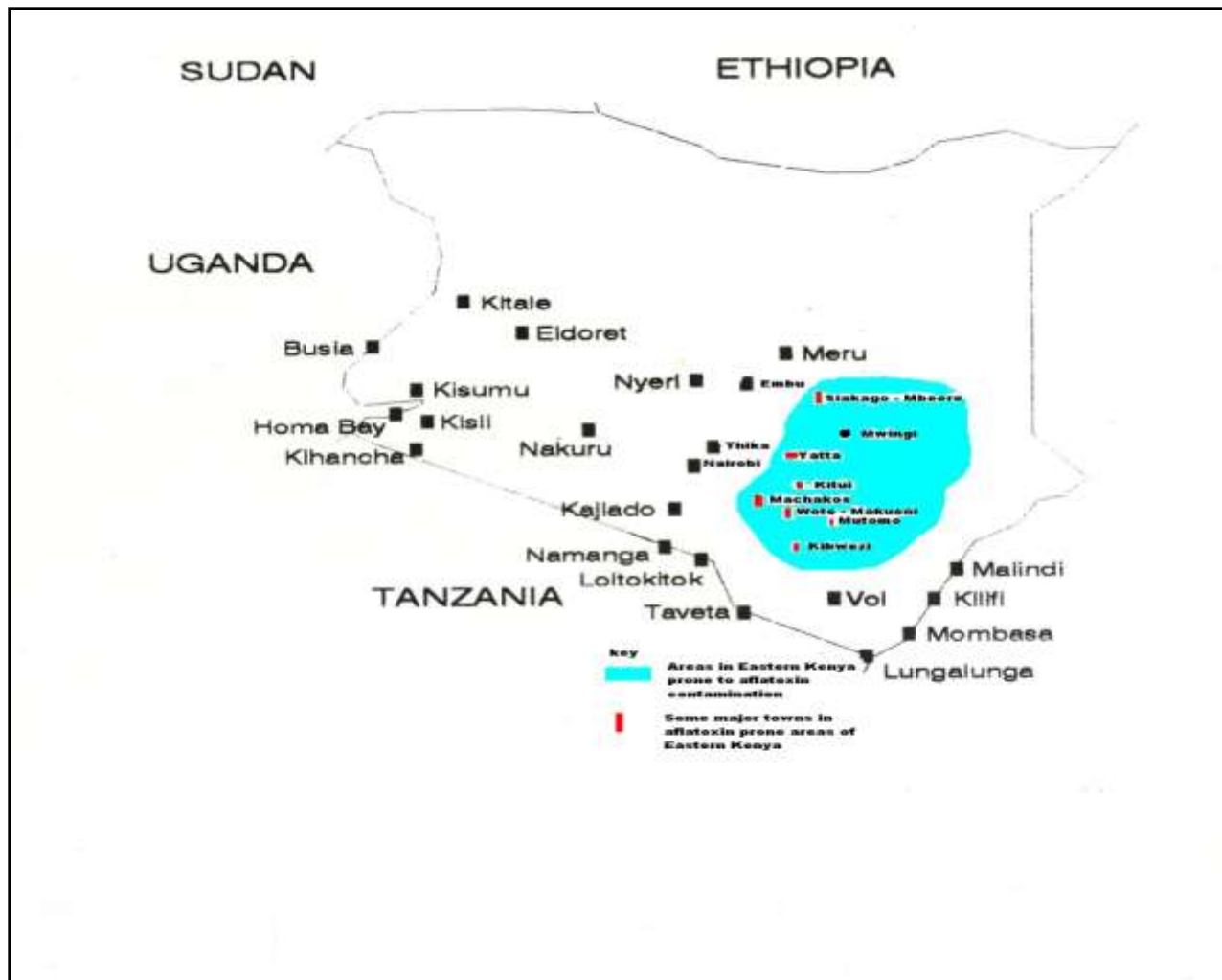


KARI CENTRE NETWORK





Sketch Map of Kenya Showing Maize Growing Areas Where Effects of Acute Aflatoxin Poisoning is Known





Sketch Map Showing Maize Growing Areas Where Effects of Aflatoxin Poisoning are Little Known





What Has NARS Done?

KARI/MOA:2004

- Surveys to establish
 - (i) factors which probably triggered the aflatoxin poisoning and
 - (ii) the source of toxigenic fungi

Survey areas: Machakos, Makueni, Kitui, Mbeere and Embu districts
(Mutambuki et al., unpublished)

Findings:

(i) Factors which likely triggered aflatoxin poisoning:

- Weather conditions: rains and high temperatures preceding harvest
- Poor grain conditioning before storage
- Poor storage e.g. some stores had leaking roofs
- Poor transportation and handling of produce
- Lack of awareness

(ii) Source of maize produce

- 70% own maize (local harvest) in Machakos, Kitui, Makueni, Mbeere and Embu districts
- All the maize from Thika was from outside the district



Cont. What Has NARS Done?

Cont. KARI/MOA:2004

Recommendations:

- Awareness creation
- Training
- Surveillance
- Breeding for resistant varieties
- Recommendations which were implemented and are currently ongoing are:
 - Awareness creation
 - Training
 - Surveillance
 - Survey on storage practices



KARI/MOA: 2008

Survey on storage practices and collection of maize samples for grain and aflatoxin analysis (Mutambuki et al, draft report unpublished):

Target: Farmers in five districts of Eastern Kenya

Preliminary findings:

(i) Storage:

- In house maize storage was most common in raised wooden platforms
- Maize was stored in polypropylene bags

(ii) Aflatoxins

- Little relationship between % DG and development of high levels of aflatoxins
- Aflatoxin levels (Table 1)



Table 1: Moisture content (MC), discoloured grain (DG) and average aflatoxin content of maize in five districts of Eastern Kenya, June 2008 (Mutambuki et al., draft report, unpublished)

District	% MC	% DG	Aflatoxin mg/kg (ppm)
Kibwezi	12.0	3.2	5.5
Makueni	12.1	2.0	1403.6
Mutomo	11.4	2.2	142.3
Yatta	11.7	2.0	479
Mbeere	12.4	2.9	79.4



Cont. What has NARS done?

University of Nairobi/KARI: 2007

- Studies on occurrence of mycotoxin-producing fungi and aflatoxin in Eastern Province (Muthomi et al)
- Results from 2007 harvest season targeting **farmers** and **traders** in Machakos were presented at 2008 KARI conference (Muthomi et al)
- *Aspergillus* and *Fusarium* spp most frequently isolated
- *Aspergillus* spp identified: *A. flavus*, *A. niger*, *A. terreus* and *A. versicolor*



Cont. What has NARS done?

Cont. University of Nairobi/KARI: 2007

- *A. flavus* frequently isolated from posho mill sweepings and from soils under the stores
- Posho mill sweepings were contaminated with aflatoxin
- *A. flavus* is the major producer of aflatoxins in Machakos
- High aflatoxin inoculum levels were found in soils, stores and posho mills

Way forward??

- Agenda for workshop

Field: Drought, diseases and pests



After harvesting



The Harvest



Storage, transport, trading and processing



Acknowledgements

- KARI – NARL, Katumani (maize program)
- Ministry of Agriculture (MOA)
- IFPRI
- University of Nairobi
- Etc

THE END



Thank you for listening