

Pest introductions and Phytosanitary measures: Case study of Introduced pests in Nigeria

J.A. Oluitan

Entomologist

Nigeria Agricultural Quarantine Service

INTRODUCED STORAGE PESTS

Nigeria is largely an agrarian society with about 70% of its citizen engaged in agriculture e.g. Maize, Sorghum, Rice, millet and Wheat

Demand for food and fiber necessitated the need for germplasm importation for crop improvement hence risk of pest introduction

Increased trade, transportation, tourism and porous borders contributed to the introduction, ease of movement and spread of invasive pests overwhelming the capacities of quarantine services in West Africa.



Larger grain borer(*Prostephanus truncatus*)



Lesser grain borer (*Rhyzopertha dominica*)

Clemson University - USDA Cooperative Extension

PROSTEPHANUS TRUNCATUS

INTRODUCTION



Distribution (Green colour) of *Prostephanus truncatus* in Africa

Nigeria witnessed some heavy losses in its agricultural economy between 1960s and 1990s as a result of incursion of insects such as larger grain borer (*Prostephanus truncatus*), lesser grain borer (*Rhyzopertha dominica*) and maize rust (*Puccinia maydis*) among others.

- 1981 –Tanzania
- 1983-Kenya
- 1984-Burundi,Togo,Benin
- 1987-Guinea
- 1989-Ghana
- 1991-Burkina faso
- 1992-Malawi,Nigeria
- 1993-Rwanda
- 1994-Zambia, Niger

P. truncatus is a much more damaging pest when compared to other storage insects including *Sitophilus oryzae*, *S. zeamais* and *Sitotroga cerealella* under similar conditions.

MAJOR CROPS AFFECTED



Cassava chips damage by *P. truncatus*

Nigeria is the largest producer of cassava in the world. It is estimated that in 2009 its production was about 36 million metric tons (MT) a year (FAO 2011).



Maize cob damaged by *P. truncatus*

J. Maundu, icipe

Worldwide production of maize is 785 million tons, Africa produces 6.5% and the largest African producer is **Nigeria** with nearly 8 million tons, followed by South Africa. Africa imports 28% of the required maize from countries outside the continent.

CROP PRODUCTION IN NIGERIA

CASSAVA

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Production (x 1000 tons)	32010	32068	34120	36304	38845	41565	45721	43410	44582	36804

MAIZE

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Production (x 1000 tons)	4107	4596	4890	5203	5567	5957	7100	6724	7525	7338

FAOSTAT (2011)

STORAGE METHODS

Storage method of these crops predisposes them to attack by
P. truncatus



crib to store Maize, Nigeria.



Rhumbus (IITA)



Maize stored on the field
(IITA)



Cassava chip storage

IMPACT

ECONOMIC IMPACT

- In the 80s, it was estimated that Tanzania lost about \$634,000 due to ban in Maize export.

SOCIAL IMPACT

- Subsistence farmers typically rely on their stored maize as food until the next maize harvest.
- results in farmers having to purchase maize.
- farmers with more extensive stock will have no maize to sell.
- threat to food security and livelihood of average Nigerians.

Puccinia spp

- *P. maydis* was introduced in the 60's to Nigeria.
- West Africa maize research unit(WAMRU) was set up as a result of the incursion.
- New virulent Pathogen strain has lead to increase in loss incurred in order to find, incorporate and evaluate resistant maize varieties.



Puccinia graminis

Nigel Cattlin/Holt Studios International

PHYTOSANITARY MEASURES TO ENSURE SAFE GRAIN MOVEMENT

Grains should be

- Fumigated against storage insect pest
- Laboratory test on samples to ensure freedom from seed-borne disease pathogen
- Grains and not seed should be traded to prevent spread of seed-transmitted pathogen
- at appropriate low moisture content to minimize mould build-up and resultant mycotoxin that is injurious to human health.

CONCLUSION

- We surely do not want to expose our agriculture to the devastating effect of insects and diseases at a time when all efforts should be geared towards developing and sustaining our nation's agricultural economy.
- Phytosanitary measures in line with ISPMs put in place should be adhered to in order to save Nigeria from exotic storage pests.