Developing New Management Strategies for the Fall Armyworm and African Armyworm

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Why? - The background

Most of the world's food is grown on **smallholder** farms. 98% of African farmers are smallholders. These farmers have less extensive tools available to control pests. The larvae of both migratory moth species are a risk to food security including maize, pasture, rice, sorghum and cash crops. Maize plants can compensate for most foliage damage. But the larvae can cut the central shoot causing 'dead heart' and damage the cobs.

African Armyworm (Spodoptera exempta) - Native to Africa. It causes periodic outbreaks. In eastern Africa, larval densities can reach up to 1,000 larvae/m².

Fall Armyworm (Spodoptera frugiperda) - Native to the Americas. Invasive in Africa since 2016. Estimated maize yield reduction in Africa of 8-16 million tons per year. The estimated value of loss of maize in Africa is US\$2,400-\$4,800 million per year.

What? - Control

Biopesticides have been suggested as an alternative to broad-spectrum pesticide because of rising concerns over synthetic pesticides cost, availability and safety to farmers and environment. **Biopesticides** include entomopathogens (insectspecific viruses, bacteria, fungus), parasitoid and predators, botanical extracts ect.













Adult Spodoptera exempta

What happens to native





Can a new study guide the development of biopesticides ?







Indirect Exploitation competition



Can S. frugiperda and S. exempta be managed in the same way?



larvae of Spodoptera exempta



larvae of Spodoptera frugiperda



https://www.cabi.org/isc/datasheet/29810 & https://www.cabi.org/isc/datasheet/29809 Butt, T. M. et al. (2016) 'Entomopathogenic Fungi: New Insights into Host-Pathogen Interactions', Advances in Genetics. Academic Press Inc., 94, pp. 307–364. doi: 10.1016/bs.adgen.2016.01.006.



Adult Spodoptera frugiperda

Spodoptera frugiperda distribution



pest when you get a new invasive pest?

Direct interference competition



Interspecific predation -Spodoptera frugiperda and Spodoptera exempta

Plant defences - compare volatiles of Cynodon grass (*Cynodon dactylon*), Maize (*Zea mays*) and Cassava (*Manihot esculenta*)

Shared pathogens, apparent competition - Fungus and virus infected larvae

Host plant overlap - Cynodon grass (*Cynodon dactylon*), Maize (*Zea mays*) and Cassava (*Manihot esculenta*)

References