Recommended agronomic practices and Landscape Management Approaches to control FAW

Technology Transfer Unit



Agronomic practices

Management recommendation depend on the farming systems

- Conventional vs conservation agriculture
- Smallholder diversified vs commercial farming
- Subsistence food crops vs cash crops
- Rainfed agriculture vs irrigation



Major questions that guide management options

- What are the major production limiting factors?
- What are the major agronomic recommendations?
- Can the recommended agronomic practice keep the pest below the economic threshold level?



Know your enemy





Egg batch of FAW

Egg batches of MSB



Farmers are challenged by complex pest problems



African stemborer Busseola fusca Africa



Spotted stemborer *Chilo partellus*

Asia





America



FAW biology and feeding behaviour: the 'bad' and the 'good'

- No diapause, could lead to early infestation
- Shorter life cycle
- Effective dispersal through ballooning within the farm
- Highly resistant to synthetic insecticides
- Highly vulnerable to rainfall
- Easy target to natural enemies
- Easy target for biopesticide control







Parasitic weed striga

 Purple witchweed (Striga hermonthica (Del.) Benth.) and Asiatic witchweed (Striga asiatica (L) Kuntze) have greater economic Compensatory growth response of maize vs strings



Striga hermontica





Agronomic practices to control pests

- Resistant/tolerant varieties
- Crop rotation
- Proper cultivation and weeding
- Intercropping
- Mechanical control
- The use of trap crop



Agronomic management option

Push-pull technology



Crop Protection Volume 105, March 2018, Pages 10-15



A climate-adapted push-pull system effectively controls fall armyworm, *Spodoptera frugiperda* (J E Smith), in maize in East Africa

Charles A.O. Midega * 유 阿, Jimmy O. Pittchar *, John A. Pickett ^b, Girma W. Hailu *, Zeyaur R.

Intercropping maize with edible legumes

Agronomy Journal

Pest Interactions in Agronomic System 🛛 🖨 Open Access 🖉 💽 🕤 😒

Maize-Legume Intercropping and Push-Pull for Management of Fall Armyworm, Stemborers, and Striga in Uganda

Girma Hailu 🕿, Saliou Niassy, Khan R. Zeyaur, Nathan Ochatum, Sevgan Subramanian

Early planting of legumes in maize intercropping

ITKs such as hand picking, putting soil, ash, sand, e.t.c.

Push-pull technology





Push-pull technology an agro-ecological approach to FAW management



Chemicals secreted by Desmodium roots control Striga and deplete the seed bank in the soils Desmodium roots fix atmospheric nitrogen in the soil; shoot and root biomass increase soil organic matter



• Evaluating the effect of maize edible legume intercropping to control FAW infestation

Agronomy Journal

Pest Interactions in Agronomic System 🛛 🖻 Open Access 🖾 🛞 🗐 🗐 🏵

Maize-Legume Intercropping and Push-Pull for Management of Fall Armyworm, Stemborers, and Striga in Uganda

Girma Hailu 🗙, Saliou Niassy, Khan R. Zeyaur, Nathan Ochatum, Sevgan Subramanian







Infestation (%) of maize due to FAW and cereal stemborer in different intercropping systems 95 ■ FAW ■ MSB 74.2 65 64.2 38.3 37.5 35.8 24.2 22.5 19.2 7.5 2.5 Maize/Beans Maize/Soybeans Conventional Sole maize Maize/Grou Climate smart ndnut PPT



Early planting of legumes in maize intercropping??

- Provides masking effect
- Particularly important for FAW management since infestation occurs at maize germination (no diapause)
- Moth prefers to lay eggs on younger plants



Applicable ITKs ??

- Crashing eggs and hand picking of neonate larvae before they disperse
- Placing ash, sand, soil in maize whorl



CULTURAL & MECHANICAL CONTROL VS PPT



Agro-ecological approach

A holistic approach to pest management with emphasis to ecological principles which enhances productivity with no harm to the environment

<u>Agro-Ecological Pest Management – An Overview</u> P. Parvatha Reddy

Agro-ecological approach is based on

- Bottom-up and territorial processes,
- Helps to deliver contextualized solutions to local problems.
- It is based on the co-creation of knowledge, combining science with the traditional, practical and local knowledge of producers.
- Enhances their autonomy and adaptive capacity,
- Empowers producers and communities as key agents of change.



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http://www.fao.org/3/i9037en/i9037en.pdf



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Thank you



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Major maize and sorghum pests







Stem borer (Busseola fusca)



Spotted stemborer (Chilo partelius)





Fall armyworm (Spodoptera frugiperda)

Spotted stemborer introduced from Asia displaced the indigenous *Busseola fusca*



www.icipe.org

Dynamics of fall armyworm, *Spodoptera frugiperda* (J. E. Smith) and cereal stemborers in maize and sorghum cropping systems in Uganda

Table . Interaction effect of crop and the sampling date on the percentageinfestation of stemborer and FAW

Sampling date	Crop	Stemborer infestation (%)	FAW infestation (%)
6 WAP	Maize	36.75 ± 2.41b	89.50 ± 1.53b
	Sorghum	55.50 ± 2.49cd	51.00 ± 2.50a
9 WAP	Maize	48.25 ± 2.50c	84.75 ± 1.78b
	Sorghum	53.25 ± 2.50c	56.50 ± 2.48a
16 WAP	Maize	24.00 ± 2.14a	86.00 ± 1.74b
	Sorghum	64.00 ± 4.81d	47.00 ± 2.50a

- The study indicates a possible displacement of stemborer from maize onto sorghum.
- The IPM strategy should take into account complex pest problem

