



The Role of Spiders in the Control of Cotton Pests in the Cotton Cropping Systems of Eastern Uganda

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ABSTRACT

Work on evaluation of crop mixtures for the management of cotton pests has shown beans to be a suitable intercrop that can augment the numbers of generalist predators in the cropping systems of E. Uganda. Incidence of generalist predators in the cotton - bean intercrop shows spiders to be more numerous (57%) as compared to other predators combined (43%). In the cotton-maize intercrop spiders are less numerous (29%) than other predators combined (71%). On cotton bordered by maize the number of spiders is about the same as in the cotton-maize intercrop. The common predators on cotton bordered by sorghum include 30% spiders. The role of spiders in the regulation of pests in cotton cropping systems is discussed.

Introduction

Studies to evaluate crop mixtures in the control of cotton pests in Eastern Uganda have shown that generalist predators occur in cotton grown in various combinations with other crops (Epieru, 1997). The common predators observed include *Chilomenes lunata*, *Scymnus spp.*, *Orius spp.*, ants, spiders earwigs and to a lesser extent, Syrphid larvae, rove beetles and chrysopids. G.M. Moawad, (1997) observed that spider populations exceeded all other predator species on cotton in Egypt. Jowah *et al.* (1993) recorded *Cheiracanthium lawrencei*, *Peucetia Kunensis* and several other unidentified species of spiders on cotton in Zimbabwe. Breene *et al.* (1993) and Riecher *et al.* (1990) reported that spiders play a significant role in the cotton ecosystem. Studies in Zimbabwe show that a combination of spiders and coccinellids is effective in the control of cotton pests during drought (Sterling, 1984).

Work done earlier showed abundance of spiders in the cotton ecosystem in E. Uganda. The objective of this study is to establish the role spiders play in the cotton ecosystem of the region.

Materials and Methods

The study was conducted during the 1995/96 and 1996/97 seasons at Serere Agricultural and Animal Production Research Institute (SAARI) and Technology Verification Centres. A randomized complete block design with six treatments four replications was used. The plot size was 20 m x 20 m. Cotton was planted at 60 cm x 30 cm, beans at 30 cm x 10 cm., maize at 75 cm x 50 cm and sorghum at 60 cm x 30 cm.

Our observations of the distribution of spiders compared to other predators on sprayed cotton shows spiders (53%) overwhelm other predators (Table 2). This could be attributed to spiders being less affected

Treatments with intercrops had one bean row between 2 cotton rows. Sorghum, maize and beans were planted surrounding a 50 m x 50 m cotton plot.

Sampling for insect pests and predators began 4 weeks after cotton germination. Each plant was examined and the number of eggs, larvae and adults of both insect pests and predators were recorded on 15 plants per crop.

Results and discussions

The incidence of generalist predators on cotton-bean, cotton-maize intercrops, and on cotton growing next to food crops is shown in Table 1. Five generalist predators were common and these included earwigs arthrocorids and ants. In cotton-bean intercrop spiders were numerous (57%) as compared to other predators combined (43%). The cotton-maize intercrop had spiders (29%) less numerous than other predators (71%).

The number of spiders on cotton bordered by maize is about the same as on the cotton-maize intercrop. The common predators on cotton bordered by sorghum include 30% spiders. In the cropping systems studied, the percentage of spiders varied between 23% and 57%.

A closer look at the numerical composition excluding ants, shows spiders surpassing other predators combined on cotton grown adjacent to sorghum, maize and beans (Table 2). However, the percentage distribution of spiders on sorghum and maize is low (Table 2). Whether the high numbers of spiders on cotton bordered by sorghum, maize and beans is due to faunal migration from the latter is not clear. However, our results clearly indicate that spiders play a very important role in the cotton cropping system of eastern Uganda.

by conventional insecticides. The varied results obtained in this study indicate that spiders as a group play a very important role in the cotton agroecosystem of eastern Uganda.

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Table 1. Percentage distribution of generalist predators on cotton-bean, cotton-maize intercrops and on cotton growing adjacent to sorghum, maize and beans.

Cropping System	% Distribution of predators				
	Spiders	Coccinellids	Earwigs	Arthocorids	Ants
Cotton-bean intercrop	57	27	11	---	5
Cotton-maize intercrop	29	15	6	10	40
Cotton adjacent to sorghum	30	22	8	18	22
Cotton adjacent maize	23	20	0	10	47

Table 2. Percentage distribution of spiders and other predators.

Crop	% Distribution of spiders and other predators	
	Spiders	Other predators*
On cotton grown adjacent to sorghum, maize and beans		
Sorghum	51.1	48.9
Maize	51.0	49.0
Beans	41.0	59.0
On sorghum and maize grown around cotton		
Sorghum	27.2	72.8
Maize	11.2	88.8
On sprayed cotton		
Sprayed cotton	53	47

*Excluding ants

