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Short Communication

Effect of variety and intercropping on two major cowpea [*Vigna unguiculata* (L.) Walp] field pests in Mubi, Adamawa State, Nigeria

Sule Hassan

Faculty of Agriculture, Adamawa State University, P. M. B. 25 Mubi, Adamawa State, Nigeria. E-mail: hansul71@yahoo.com. Tel.: +234 08051045452.

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Cowpea is regarded as one of the major source of dietary protein in many parts of Africa, but yield losses due to insect pests' activities reduce available natural resources for human consumption. Field trials were conducted during the 2006 and 2007 cropping season at Mubi, Nigeria, to determine the effect of variety and intercropping on three major field insect pest of cowpea. The experimental treatments consist of two variety of cowpea via Kanannado white and Kanannado brown and intercrop of each variety of cowpea seed with sorghum arranged in a complete randomized block design. The population of aphids (*Aphis craccivora* Koch.) and thrips (*Megalarothrips sjostedi* Trybom) were significantly (P>0.05) lower in cowpea + sorghum intercrop in 2006 and 2007 cropping season than sole cowpea crop. Similarly in 2007 cropping season population maruca pod borer (*Maruca vitreta*) was significantly (P>0.05) lower in cowpea + sorghum intercrop than sole cowpea crop but in 2006 cropping season, the reverse was the case. By and large, the result of the study shows that cowpea + sorghum intercrop reduces populations of major field pests of cowpea.

Key words: Intercropping, cowpea, aphids, thrips, maruca.

INTRODUCTION

Cowpea [*Vigna unguiculata* (L.) Walp] is regarded as an integral part of traditional cropping system throughout Africa (Isubikalu et al., 2000). It is also a legume of considerable importance being a major source of dietary protein in many parts of Africa (Sule and Bello, 2006).

Despite these importances the crop is attacked by a spectrum of pest species (Isubikalu et al., 2000). In Nigeria, major field insect pests of cowpea include aphids (*Aphis craccivora* Koch.), thrips (*Megalarothrips sjostedi* Trybom), legume pod borer (*Maruca vitrata*), spiny brown bug (*Clavigralla tomentosicollis* Stal.), flower beetle (*Mylabris* Species), leaf-footed plant bug (*Leptoglossus australis* F.) and foliage beetle (*Oathaca mutabilis* Salhib) (Malgwi and Onu, 2004).

Yield losses due to activities of insect pests especially in the tropics reduce available natural resource for human consumption. For instance, the Food and Agricultural Organization of the United Nation (FAO, 1985) reported that annual losses due to insect pests alone stands at about 15-20% during production and 18-20% during storage. However according to Opareake et al., (2000) yield losses in cowpea due to insect pests in Nigeria farms was estimated to be above 80%.

Although infestation could be controlled through the use of agrochemicals, the use of insecticide is unsustain-able due to the low purchasing power of the farmers and the likely hazards associated with their use. This paper therefore reports on the use of crop variety and intercropping as a means of reducing field insect pests of cowpea.

MATERIALS AND METHODS

The field experiment was conducted during the 2006 and 2007 cropping season at the teaching and research farm of Adamawa State University Mubi (Latitude $13^{o}10^{'}$ -$13^{o}30^{'}$E and Longitude $10^{o}10^{'}$ N-$10^{o}30^{'}$N). Two local varieties of cowpea viz. Kanannado white and Kanannado brown were grown as sole crops and intercropped with sorghum. Treatment combination therefore were; Kanannado white, Kanannado brown, Kanannado white + sorghum and Kanannado brown + sorghum which were arranged in a complete randomized block design with three replication of each Cowpea seed was planted in 55 × 20 cm plots. All plots were separated

Table 1. Population of aphids' species as influence by variety and intercropping during the rainy seasons of 2006 and 2007.

Treatments	Population of Aphids	
	2006	2007
Kanannado White	113.0[a]	67.7[a]
Kanannado Brown	128.7[a]	93.3[a]
Kanannado White + Sorghum	72.3[b]	47.3[a]
Kanannado Brown + Sorghum	86.0[b]	48.3[a]
LSD	26.07	36.90

Means followed by same superscripts within same column are not significantly different at P= 0.05

Table 2. Population of flower thrips at different interval as influence by variety and intercropping during the rainy seasons of 2006 and 2007.

Treatments	Population of flower thrips					
	2006			2007		
	30 DAP	40DAP	50DAP	30 DAP	40DAP	50DAP
Kanannado White	16.7[a]	19.3[a]	12.7[a]	14.0[b]	12.3[a]	9.0[b]
Kanannado Brown	18.3[a]	20.3[a]	15.7[a]	19.3[a]	14.0[a]	12.3[a]
Kanannado White + Sorghum	8.7[b]	10.7[b]	8.7[a]	4.0[d]	6.3[a]	7.3[b]
Kanannado Brown+ Sorghum	10.3[b]	11.3[b]	9.7[a]	7.0[c]	9.3[a]	8.0[b]
LSD	2.8	3.1	3.0	2.1	3.9	3.2

Means followed by same superscripts within same column are not significantly different at P= 0.05. DAP= Days after planting

by 1 m alleys and the blocks were 2 m apart, also cowpea population in the sole and intercrop were maintained constant.

Sampling for aphids' infestation was done 10 days after cowpea emergence on 5 randomly selected cowpea plants per plot. Population of flower thrips and maruca pod borers were assessed at 30, 40 and 50 days after emergence by picking from each plot 5 flower buds or flower and place in vial containing 30% ethanol, and were later desiccated and the number of thrips and maruca larvae recorded.

Data obtained were subjected to analysis of variance using Genstat computer software version 7.2 Discovery Edition 3 and least significant difference (LSD) was used to differentiate between treatment means.

RESULTS

Intercropping significantly reduce aphid population in the 2006 cropping season with the population being consistently lower in cowpea + sorghum intercrop than in sole cowpea crop for both varieties (Table 1). However aphid populations between the two cowpea varieties were not significantly different from each other. In 2007 cropping season cowpea + sorghum intercrop recorded low population of aphid than sole cowpea crop but the difference between the treatments was not significant.

Similarly, cowpea + sorghum intercrop reduce thrips population significantly compared to sole cowpea crop at 30 and 40 days after planting in 2006 cropping season. However population of thrips recorded at 50 days after planting was not significantly different among the treatments (Table 2) . In 2007 cropping season both intercropping treatments significantly reduced thrips population at 30 days after planting with Kanannado white + sorghum intercrop having the lowest thrips population and sole Kanannado brown having the highest thrips populations. At 40 and 50 days after planting, there was no significant difference between Kanannado white + sorghum intercrop.

Maruca population was lower in sole Kanannado white and brown but not significantly different from the remaining treatments at 30 days after planting in 2006 cropping season. However at 40 and 50 days after planting sole Kanannado white and brown recorded significantly lower maruca population than Kanannado white + sorghum intercrop and Kanannado brown + sorghum intercrops. Also in 2007 cropping season Kanannado white + sorghum intercrop recorded significantly lower maruca population at 30 and 50 days after planting than the remaining treatments (Table 3)

DISCUSSION

Aphids, thrips and maruca pod borer were the most abundant and serious insect pests within the cowpea cro-

Table 3. Population of maruca at different interval as influence by variety and intercropping during the rainy seasons of 2006 and 2007.

Treatments	Population of Maruca					
	2006			2007		
	30 DAP	40DAP	50DAP	30 DAP	40DAP	50DAP
Kanannado White	3.3[a]	5.3[b]	1.6[b]	7.0[b]	10.0[a]	4.3[b]
Kanannado Brown	5.0[a]	5.8[b]	2.7[b]	11.0[a]	12.0[a]	8.0[a]
Kanannado White + Sorghum	8.0[a]	8.7[a]	5.0[a]	3.7[c]	5.7[a]	1.7[c]
Kanannado Brown + Sorghum	7.0[a]	9.0[a]	6.0[a]	6.3[b]	8.0[a]	3.7[b]
LSD	3.1	2.8	1.5	2.0	2.3	1.6

Means followed by same superscripts within same column are not significantly different at P= 0.05. DAP= Days after planting

pping system (Malgwi and Onu, 2004). The impor-tance of intercropping as a method of reducing pest at-tack on cowpea has been reported (Ampong-Nyarko et al., 1994).

In this study aphids and thrips recorded in the cowpea + sorghum intercrop were lower than those in the sole cowpea crop, this trend was observed in both 2006 and 2007 cropping season. The reasons for this reduction of aphids and thrips population in the intercrop may be due to the micro-environmental effect of the associated crop which may attract predators and or disruption of insect visual search for preferred host. Nampala et al. (2002) reported that mixed cropping of cowpea with sorghum reduced infestation by aphids and thrips but increase pod borer and pod sucking bug populations. The result of the present study seems to agree with the popular opinion that intercropping has the potential to reduce aphid populations on cowpeas. For instance, Sinthananthem et al, (1990) and Ogenga-Latigo et al, (1992) reported that intercropping cowpea with maize reduced the incidence of *Aphid fabae* on cowpea than on sole cropped cowpea. Furthermore, various studies have shown that variations in herbivore load in crop mixtures compared to monocultures increase the abundance of natural enemies (Ogenga-Latigo et al., 1992; Kyamanywa et al., 1993).

Studies on the influence of intercropping on maruca infestation have also been reported. Ezueh (1991) reported that intercropping cowpea with cereals increased infestation by maruca borer, however Ahoaka-atta et al. 1993 reported less damage by pod borers on cowpea intercropped with maize. In the present study, sole cow-pea crop recorded low maruca population than cowpea + sorghum intercrop in 2006 cropping season, but in 2007 cropping season cowpea + sorghum intercrop recorded low maruca popu-lation than sole cowpea crop. Although the reasons for this apparent contradiction on the effect of intercrop on maruca over season are not well understood, Risch et al., (1983) documented that a given pest may show varia-ble response over time.

In conclusion, the findings of this study shows that cowpea + sorghum intercrop reduce populations of two major field pest of cowpea but more investigation is needed to verify the effect of intercropping cowpea with sorghum on the population of maruca.

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