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Suppression of Insect Pest Damage to Pigeon pea [Cajanus cajan (L.) Millsp.] With Plant-derived Insecticides at Makurdi, in the Southern Guinea Savanna of Nigeria

Aku Ayuba Ambi

Kaduna state college of education, Nigeria

Abstract

Pigeon pea, which is a subsistence crop and serve as a good source of protein to some resource poor farmers in Nigeria has been suffering from productivity-limiting factors. Among these factors are insect pests. In order to mitigate the challenges of these insect pests, field experiments were carried out at the Teaching and Research Farm of the University of Agriculture, Makurdi, Nigeria, to test the potency of four plant-derived insecticides against the major crop pests. Aqueous extracts (10% v/v) of the leaves of Hyptis suaveolens (HSE) and Zanthoxylum xanthoxyloides (ZXE), the seed oils (5% v/v) of Azadirachta indica (NSO) and Canarium schweinfurthii (CSO), all applied in Tetrapleura tetraptera solution, as well as cypermethrin + dimethoate (CP+DT), and T. tetraptera solution (as control treatment) were assigned to plots laid in randomized complete block design with four replications in 2011 and three replications in 2012. Three weekly applications were made to pigeon pea commencing at 50% flowering. Densities of thrips, Megalurothrips sosjedti Trybom., legume pod borer, Maruca vitrata (Fab.), and the pod-sucking bug, Clavigralla tomentosicollis Stal., were quantified. Insect damage to pods and seeds, pod production and seed yield per plot were recorded. Pest densities were correlated with insect damage and crop yield. Data for all parameters were subjected to variance analysis and significantly different ($P \leq 0.05$) means were separated using Duncan's Multiple Range test. The insecticides significantly reduced densities of thrips (79.5-99.3%), Maruca larvae (66.6-100.0%), and C. tomentosicollis (73.3-100.0%) in both cropping seasons. Floral damage by thrips and Maruca in insecticide-treated plots was reduced by 50.8-100.0% but no plant-derived insecticide was as effective as CP + DT. Reduction in pod damage ranged from 33.6-56.3% in insecticide-treated plots; only CSO consistently differed significantly from CT + DT. Pod yield in plots treated with HSE and ZXE were statistically comparable with those of plots treated with CT + DT. Treatment differences in seed yield were not significant except in 2011 when plots treated with ZXE gave lower yield than the plots treated with CT + DT. Seed yield loss mitigated by the applied insecticides ranged from 66.7-100.0%. It is evident that the plant-derived insecticides tested, particularly NSO, can substitute for CT + DT in the management of key field pests of pigeon pea.

Biography:

Aku Ayuba Ambi was born in 1963. He obtained his Ph.D. in Agricultural Entomology in 2016 with the University of Agriculture, Makurdi, Nigeria. He is presently a chief lecturer with the College of Education, Gidan Waya, in Kaduna State of Nigeria. He has carried out a lot of researches and presented research paper in conferences and publish some research articles in reputable journals.

Speaker Publications:

1. Annona senegalensis (Annonaceae). Performance as a Botanical Insecticide for Controlling Cowpea Seed Bruchids [Callosobruchus maculatus(F) [Coleoptera: Bruchidae] in Nigeria. Journal of Plant Disease and Protection 105(5):513-519.1998.
2. Control of Seed Bruchids [Callosobruchus maculatus(F)] Infestation in Cowpea [Vigna unguiculata (L)Walp] with Clausena anisata (Rutaceae). Bioscience Research Communication 14(2):105-211.2002.

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