

IPM Proves Most Effective in Controlling Insect Pests of Cowpea in Africa

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Cowpea (also known as black-eyed pea) originated in Africa and is the major source of plant proteins in the diet of rural populations in sub-Saharan Africa. The grains contain 25% protein and several vitamins and minerals. In Africa, humans consume the young leaves, immature pods, immature seeds, and the mature dried seeds. The stems, leaves and vines are used as animal feed. Cowpea is widely traded; providing cash for the farmer and inexpensive nutrition for millions of rural and urban dwellers.

Insect pests pose the greatest threat to cowpea production. The crop is severely attacked at every stage of its growth by insects. High pest densities occur at many locations with complete loss of grain yield if no control measures are taken [1]. Farmers can improve yield 10-fold if insecticides are used [2]. The most damaging insect pests are aphids, flower thrips, the Maruca pod borer and pod-sucking bugs. The cowpea aphid causes economic losses directly by sucking sap and indirectly through transmission of viral diseases. The Maruca pod borer feeds on every part of the cowpea plant. Thrips occur every growing season and result in yield losses through premature dropping of flowers. Pod bugs suck sap from green pods, causing abnormal pod and seed formation and yield losses of 30-70% [4]. In the field, it is common to find more than three insect pest species on the same plant. Early research workers recommended six to seven weekly sprays starting a few days after seedling emergence.

Since the late 1970s, extensive studies on insect pests of cowpeas have been conducted at the International Institute of Tropical Agriculture (IITA). Cowpea varieties with modest levels of resistance to insect pests have been developed [3]. These improved varieties still need 2-3 sprays of insecticides. Research on biological control of cowpea pests determined that the level of pest control was inadequate for suppressing the pest populations [3].

Research demonstrated that aphids are amenable to cultural control since both high plant density and early planting reduced their infestations. As a result, insecticide application at the vegetative stage may not be essential. However, thrips, Maruca and pod-sucking bugs are not effectively controlled by the cultural practices [5]. Well-timed insecticide applications starting at bud initiation control these late season pests. 2-3 sprays of insecticide are sufficient to produce good high cowpea grain yields when improved varieties are used and sprays are well-timed [6]. Research indicated that combining cultural practices and spraying once each at budding, flowering and podding stages was more effective and profitable than spraying cowpea weekly throughout the growing season. An IPM practice that combines early planting, close spacing cowpea and three insecticide applications had the highest yield with a 51% gain over farmers traditional practice of 5-6 insecticide applications [7]. The 3-spray treatment also provided the highest net returns for growers with a return of 3:1 [8]. The IPM measures integrating cultural practices with foliar sprays out-yielded cultural treatments suggesting that use of cultural controls alone is not effective in managing pest infestations [7]. Cowpea production cannot be successful without insecticide application [7] [2]. IITA's *Guide to Cowpea Production in West Africa* states that "generally, 2-3 sprays with insecticides are required for a good crop of cowpea." [4].



Maruca Bug Damage



Aphid-transmitted virus



Insect damage: Light (L) Heavy (R)

References

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