



“STUDIES ON COWPEA APHID AND THEIR MANAGEMENT: A REVIEW”

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ABSTRACT:

Cowpea aphid (Aphis craccivora Koch) is a major pest of cowpea and other leguminous crops, causing significant economic losses worldwide. Various studies have been conducted to evaluate the effectiveness of different management strategies for controlling cowpea aphids. Cultural control measures, such as crop rotation, planting resistant varieties, and intercropping, have shown promising results in reducing aphid populations. Biological control methods, including the use of natural enemies like ladybugs and parasitic wasps, have also been effective in managing cowpea aphids. Insecticides can also be used, but their use should be minimized due to their negative impact on the environment and non-target organisms. Integrated pest management (IPM) strategies, combining multiple control measures, have been shown to provide effective control of cowpea aphids while minimizing the use of insecticides.



KEYWORDS: Cowpea aphid, Biological control methods and Management.

INTRODUCTION

Cowpea is the most important legume crop, also known as Lobia, it belongs to family Leguminaceae. It is used as a green legume, fodder, vegetable as well as green manure crop. It is an important source of energy, minerals, vitamins and roughages. There are about 21 insect pests of different groups which are recorded to damage cowpea crop from germination to maturity (Choudhary et al., 2017). The important insect species attacking cowpea crop are: aphid, *Aphis craccivora* Koch; jassid, *Empoasca fabae* (Harris); thrips, *Megaleurothrips distalis* Karny; armyworm, *Mythimna separata* (Walker); semilooper, *Thysanoplusia orichalcea* (Fab.); Leafminer, *Phytomyza horticola* Meigen and pod borer, *Helicoverpa armigera* (Hubner) resulting in heavy yield losses (Satpathy et al., 2009). Among these, cowpea aphid, *Aphis craccivora* Koch is the most serious pest of this crop, causes 20-40 percent yield loss (Choudhary et al., 2017). The sap-sucking insects like aphids (*A. craccivora* Koch) cause considerable damage to the crop and is reported as one of the important, major and economic pests of cowpea (El-Ghareeb et al., 2002).

The cowpea aphid, *A. craccivora* belongs to the family Aphididae of order Hemiptera, suborder Homoptera (Choudhary et al., 2017). The aphid causes both qualitative and quantitative losses in the seed yield and crop production by different ways include: Nutrient drain which cause direct reduction of plant productivity, transmission of viruses, phytotoxicity as a result of saliva toxins and excretion of honeydew leading to the development of black sooty mold and leaf

shedding (Kotadia and Bhalani, 1992), which also attract saprophytic fungi covering the leaf surface and accelerating the ageing of leaves (Schepers, 1988).

DISCUSSION:

This is a serious pest on cowpea, yard-long bean, hyacinth bean and peanut starting from the seedling stage to pod-producing stage. It acts as a direct pest and also transmits virus diseases. Although this aphid remains active throughout the year, it causes severe damage during the cool dry season.

BIOLOGY :

Adult: Unlike many insects, most aphids reproduce asexually in the tropics. They usually reproduce through parthenogenesis (development of embryo without mating with males) and are viviparous (give birth to nymphs directly rather than eggs). The early instar nymphs are grey in color, whereas the late instar nymphs and adult are black. Both wingless and winged forms occur. Winged forms are produced when population density is high, when host plants are of inferior quality, etc. The wingless forms are more common. Aphids mostly are found in groups. The nymphal period is about 5 to 8 days, and the total lifecycle is 11 to 14 days.

Damage symptoms : *A. craccivora* prefers to feed on legume crops; it is commonly known as "cowpea aphid." Both the nymphs and adults possess piercing and sucking mouthparts. They occur in large numbers on the tender shoots, lower leaf surfaces, petioles, flowers and pods, and suck the plant sap. Slightly infested leaves exhibit yellowing. Severe aphid infestations cause stunting, crinkling and curling of leaves, delayed flowering, shriveling of pods, resulting in yield reduction. Young plants may be killed due to heavy infestation. *A. craccivora* also transmits *Bean common mosaic virus* and *Cucumber mosaic virus* in a non-persistent manner (Damayanti *et al.* 2009). Large populations of the pest secrete substantial quantities of honeydew, which favors the growth of sooty mold on leaves and reduces the photosynthetic efficiency of the plants.

MANAGEMENT :

1. Avoid monoculture and follow crop rotation. The selected field should be located away from other legume crops.
2. Use entomopathogenic fungi (EPF) such as *Beauveria bassiana*, *Metarhizium anisopliae*, *Verticillium lecanii* and *Hirsutella thompsonii* at a concentration of 1×10^8 conidia ml⁻¹ (Ekesi *et al.* 2000; Saranya *et al.* 2010).
3. Use neem oil, either alone or in combination with the EPF biopesticides (El-Hawary and Abd El-Salam 2008; Halder *et al.* 2013).
4. The ladybird beetles (*Menochilus sexmaculatus*, *Brumus suturalis*, *Harmonia dimidiata*, *Brumus suturalis* and *Coccinella septempunctata*) and green lacewings (*Chrysoperla carnea*) are efficient predators of aphids (Muniappan *et al.* 2012). Protect the population of these predators by avoiding the use of broad-spectrum pesticides.
5. *A. craccivora* can develop resistance to pesticides (Mokbel and Mohamed 2009). Use only those pesticides that have been recommended by local extension staff. Do not use the same compound or pesticide group continuously to avoid the development of pesticide resistance in insects.

Cowpea aphid (*Aphis craccivora* Koch) is a common pest that affects cowpea and other leguminous crops in many regions of the world. It is a small, soft-bodied insect that feeds on the sap of the plant, causing damage to the leaves, stems, and pods. If left untreated, cowpea aphids can significantly reduce crop yields and quality. There have been several studies conducted on cowpea aphids and their management. Here are some of the key findings:

Cultural control: Crop rotation, planting resistant varieties, and intercropping with non-host crops are some of the effective cultural control measures for managing cowpea aphids.

Biological control: Natural enemies of cowpea aphids, such as ladybugs, lacewings, and parasitic wasps, can be used to control their populations. Studies have shown that the release of these natural enemies can significantly reduce cowpea aphid populations.

Chemical control: Insecticides can be used to control cowpea aphids, but their use should be minimized due to their negative impact on the environment and non-target organisms. Studies have shown that some insecticides, such as imidacloprid and thiamethoxam, are effective in controlling cowpea aphids.

Integrated pest management (IPM): IPM involves the use of multiple control measures to manage pests effectively. Studies have shown that the integration of cultural, biological, and chemical control measures can provide effective control of cowpea aphids while minimizing the use of insecticides.

Cowpea aphids can be effectively managed through a combination of cultural, biological, and chemical control measures, as well as through the use of integrated pest management strategies.

CONCLUSION:

In conclusion, cowpea aphid is a serious pest that can cause significant damage to cowpea and other leguminous crops. However, various studies have demonstrated that there are effective management strategies for controlling cowpea aphids. Cultural control measures such as crop rotation, planting resistant varieties, and intercropping, biological control methods, including the use of natural enemies, and chemical control measures can all be used to manage cowpea aphids. Integrated pest management (IPM) strategies, which combine multiple control measures, have also shown promise in effectively controlling cowpea aphids. By using a combination of these management strategies, farmers can protect their crops from economic losses caused by cowpea aphids while minimizing the negative impact on the environment and non-target organisms.

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