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## Ash Weevil *Myllocerus subfasciatus* Guerin-Meneville (Coleoptera; Curculionidae) – An Emerging Threat to Brinjal Cultivation

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### Abstract

Brinjal is one of the predominant vegetable crops grown in India. The biotic factors viz., shoot and fruit borer *Leucinodes orbonalis* Guen; jassid *Amrasca biguttula biguttula* (Ishida), whitefly *Bemisia tabaci* (Genn.), aphid *Aphis gossypii* Clover are major yield constraints in brinjal cultivation. In addition to the above the infestation of ash weevil *Myllocerus subfasciatus* causes major yield loss. Under favourable conditions it has the potential to cause 100% yield loss. The adult beetle notches the leaf margins and resulting in wilting of plants in patches. The grubs feed on the roots and causes drying of plants. As the damage occurs mostly during flowering and fruit initiation period the loss will be severe. The egg, larva and pupal periods last for about 3-11, 3-42 and 5-7 days respectively. Grubs being subterranean need timely intervention for effective management. Application of oiled neem cake, entomopathogenic nematode, insecticide application are some of strategies used for the management of ash weevil in brinjal.

### Introduction

Brinjal, *Solanum melongena* L. is an important vegetable crop grown in many parts of the world. Brinjal is adapted to a wide range of climatic conditions and capable of high yield in hot wet environments. It has reasonable source of vitamins and minerals and affordable to all the economic strata of Indian population. India is the second largest producer of brinjal after China. During 2019-20 the area under brinjal cultivation in India was 7,41,000 hectares with a production of 13.00 mt. Though new hybrids and improved cultivation practices increased the average productivity of brinjal, the abiotic and biotic factors impact the productivity. Among the biotic factors shoot and fruit borer *Leucinodes orbonalis* Guen; jassid *Amrasca biguttula biguttula* (Ishida), whitefly *Bemisia tabaci* (Genn.), aphid *Aphis gossypii* Clover, epilachna beetle *Epilachna vigintioctopunctata* and stem borer *Euzophera perticella* Rag. are the major constraints of brinjal cultivation.

### Ash Weevil *Myllocerus subfasciatus* Guerin Guerin-Meneville

The ash weevil *Myllocerus subfasciatus* was minor pest during 90's now threatens brinjal cultivation in many regions. One adult and 10 larvae/ plant was enough to cause total loss in 45 days old crop and 50% loss in 90 days old crop (Gowda and Veeresh, 1986). The infestation during flowering stage reduces the yield drastically and warrants more number of insecticide applications (Shanmugam *et al.*, 2018). Most of the peasants observe adult beetle movement and resort for management measures, but fail to control the grubs which are major impeding factor for withering of plants.

The grubs being subterranean needs appropriate interventions for effective management (Figure 1). *M. subfasciatus* also be considered as a pest of quarantine significance as subterranean forms of larvae and pupae possibly spread through movement of planting material from nurseries to main field or other vegetable growing regions (Nagesh et al., 2016).



Figure 1: *M. subfasciatus* grubs feeding on the roots of brinjal

### Damage Symptoms

- *M. subfasciatus* adults feed on foliage. The adult beetle notches the leaf margins and resulting in wilting of plants in patches (Figure 2).



Figure 2: Notching of leaves by *M. subfasciatus* adults

- The grubs are subterranean and feed on roots of the plants. The grub damage results in wilting, drying and death of infected plants. The damaged plants will come off easily when pulled.
- The damage due to grub feeding is severe throughout the year except during the summer. The plants start drying at the time of flowering (Figure 3).

### Life Cycle

**M**. *subfasciatus* adults are light grayish to white with four black spots on the wing. The eggs are light yellow and laid deep in the soil. The grubs are

fleshy and light yellow colour. A single adult lays more than 100 eggs of which 80% hatch. Pupation occurs in the soil. The egg, larva and pupal periods last for about 3-11, 3-42 and 5-7 days respectively.



Figure 3: Drying of Plants due to *M. subfasciatus* damage

### Management

- Application of oiled neem cake @ 250-500 kg/ha at the time of planting and repeat at flowering to kill the ash weevil grubs present in the root zone of the brinjal plants (Source: IHR, Bengaluru).
- Collect and destroy the adult beetles.
- Application of entomopathogenic nematode (*Heterorhabditis* or *Steinernema*) @ 2.5 kg/ha along with decomposed farm yard manure or neem cake at the time of planting and repeated after 30 days on need basis (Source: NBAIR, Bengaluru).
- The combined application of entomopathogenic nematode *Heterorhabditis indica* and soil dwelling fungus *Metarhizium anisopliae* reduces the ash weevil grub population in brinjal (Source: NBAIR, Bengaluru).
- Application of granular insecticides (Carbofuran 3G 15 kg/ha or Fipronil 0.3GR @ 25 kg/ha) to manage the grubs present in the root zone. Foliar insecticide application to manage the adult weevil damage.
- Plastic mulching along with neem cake or entomopathogenic nematode application also reduce the ash weevil damage (Shanmugam et al., 2018).

### Conclusion

**M**. *subfasciatus* being subterranean timely initiation of management practices is a prerequisite for effective management. Use of neem cake and biocontrol agents viz., entomopathogenic nematode and green muscardine fungus *Metarhizium anisopliae* as prophylactic measure will reduce the yield loss due to ash weevil.

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