

## **The insects of Leguminous crops:**

**(Bean, Pea, Cowpea, Chickpea, .....)**

### **1-Large Bean Seed Weevil**

***Bruchus rufimanus* (Coleoptera: Bruchidae)**

**Distribution:** *Bruchus rufimanus*, the broad bean weevil, is primarily found in temperate regions of Europe, North Africa, and parts of Asia. It is especially common in regions where broad beans (*Vicia faba*) are cultivated. Within these regions, the distribution of *B. rufimanus* can vary depending on factors such as local climate conditions, host plant availability, and agricultural practices.

**Host plants:** Bean, Pea and Lentil

### **The Economic importance:**

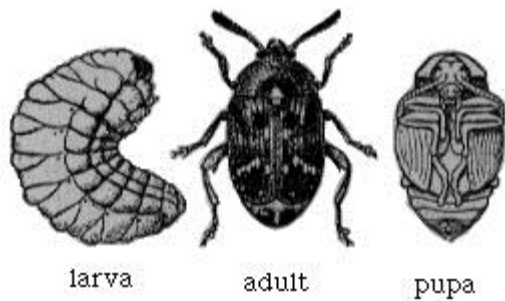
**Crop Damage:** *B. rufimanus* larvae feed on the seeds of leguminous plants, including broad beans. This feeding can lead to reduced seed quality, including damage to seed coats and a decrease in seed weight. Severe infestations can result in significant yield losses.

Infestation by *B. rufimanus* can reduce the market value of seeds due to damage and contamination. Infested seeds may be unsuitable for planting or processing, leading to economic losses for farmers and seed producers.

**Storage Losses:** *B. rufimanus* can also infest stored seeds, leading to post-harvest losses. Infested seeds can lose viability and quality, reducing their value for consumption or sale.

## Life cycle:

Adult can infest seeds in the field or in storage. Eggs are lay on maturing pods in the field, but in storage are lay loosely among seeds. After hatching larvae burrow into the seed and complete their development (including pupation) within a seed before emerging as adult. Adults do not feed on seeds, but may pollen and nectar in flowers. Bean bruchids breed rapidly in storage and can complete a life cycle in 23 days. However, they can continue to breed slowly at temperature as low as 18 °C.



## Methods control:

Cultural control: Bruchid development in storage can be slowed by cooling aeration. Seed temperature and moisture should be monitored regularly during aeration.

### 1. Cultural Control:

- **Crop Rotation:** Rotate legume crops with non-host crops to disrupt the life cycle of Bruchidae beetles.
- **Timely Harvest:** Harvest legume crops promptly to reduce the chances of infestation.
- **Bruchid development** in storage can be slowed by cooling aeration. Seed temperature and moisture should be monitored regularly during aeration.

## 2. Physical Control:

- **Screening:** Use fine mesh screens or netting to cover stored seeds and prevent adult beetles from laying eggs on them.
- **Sieving:** Sieve stored seeds to remove infested seeds and beetle larvae.

## 3. Chemical Control:

- **Fumigation:** Use fumigants, such as phosphine, in sealed containers to control Bruchidae beetles in stored seeds. This should be done by trained professionals following recommended protocols.

## 4. Biological Control:

- **Parasitoid Wasps:** Introduce parasitoid wasps that attack Bruchidae beetle eggs or larvae. These natural enemies can help reduce beetle populations.
- **Predators:** Encourage the presence of natural predators, such as birds, spiders, and ground beetles, which feed on Bruchidae beetles.

## 5. Plant Resistance:

- Use crop varieties that are resistant or less susceptible to Bruchidae beetle infestations. Plant breeding programs often develop varieties with resistance to pests.

## **Black Bean Aphid**

### ***Aphid fabae* (Homoptera: Aphididae)**

**Host Range:** In addition to broad beans, black bean aphids infest a wide range of other plants, including peas, potatoes, sugar beets, and various ornamental plants.

The black bean aphid, also known as *A. fabae* or blackfly, is a common agricultural pest that infests a wide range of plants, including broad beans (*Vicia faba*), hence the common name "black bean aphid."

**Description:** Black bean aphids are small, soft-bodied insects that vary in color from dark green to black. They have long legs and antennae and feed by piercing plant tissues and sucking sap.

**Distribution:** South America, Africa and Middle East

### **Economic importance**

The black bean aphid (*A. fabae*) is a significant agricultural pest with several economic impacts:

**Crop Damage:** Black bean aphids feed on the sap of a wide range of plants, including broad beans (*V. faba*), sugar beets, potatoes, and various ornamental plants. Their feeding can cause stunted growth, yellowing of leaves, and distortion of plant tissues, leading to reduced crop yields and quality.

**Transmission of Plant Diseases:** Black bean aphids can transmit plant viruses, such as bean yellow mosaic virus and beet yellows virus, while feeding. These viruses can cause further damage to crops, leading to additional yield losses.

## **Life cycle:**

The life cycle of the black bean aphid (*Aphis fabae*) typically includes four stages: egg, nymph, adult, and winged adult (apterous and alate). Here's a general overview of the life cycle:

1. **Egg Stage:** The life cycle begins when a fertilized female aphid lays eggs in early spring and colonies develop soon on the young leaves and shoots. In some cases, black bean aphids can overwinter as eggs.
2. **Nymph Stage:** When the eggs hatch, they release nymphs. Nymphs resemble adult aphids but are smaller and lack wings. They go through several molts as they grow, shedding their exoskeletons each time.
3. **Adult Stage:** Once the nymphs reach maturity, they become wingless adult aphids, known as apterae. These adults are usually female and can reproduce asexually, giving birth to live young without mating. This rapid reproduction allows aphid populations to increase quickly under favorable conditions.
4. **Winged Adult Stage:** As the population becomes more crowded or when environmental conditions change, some adult aphids develop wings (alatae) through a process called polyphenism. These winged adults can fly to new host plants, helping to spread the infestation.

The life cycle of the black bean aphid can be completed in as little as 10 days under optimal conditions, allowing for multiple generations within a single growing season. This rapid reproduction contributes to the aphid's ability to infest crops and plants quickly.

### **Control methods:**

Control: Control of black bean aphids can be challenging due to their rapid reproduction and ability to develop resistance to insecticides. Integrated pest management (IPM) strategies that combine cultural, biological, and chemical control methods are often used to manage infestations.

Natural Enemies: Several natural enemies, including ladybird beetles *Coccinella septumpunctata*, lacewings (aphid lion), and parasitic wasps, and larvae of syrphidae insects feed on black bean aphids and help to regulate their populations in nature.

## Pea Blue Butterfly (long- tailed blue)

### *Lampids boeticus* (Lepidoptera: Lycaenidae)

On the hind wing by the tail are two small eye spots which show on both sides of the wing.



**Distribution:** Asia, Africa, south Europe, Hawaii and Australia

**Host plants:** (main) various species of the pea family (Fabaceae). (Alternative) cultivated and wild species of Leguminosae

#### **Life cycle:**

The eggs are lay singly on the shoots or near the young flowers, and the young caterpillar feeds first inside the flower and then on the young pod. Pupation takes place on the plant foliage. The adult show distinct sexual dimorphism in the upper surfaces of the males wings which is bright blue, but the female is basically brown.

**Damage:** The larvae eat out buds and flowers, small pods may also be damaged. Look for larvae inside buds and flowers and for damages, the pale larvae may be difficult to see in pale colored buds, look also for distinctive butterflies.

**Method control:**

**Cultural control:** Irrigation of crops at flowering will improve plant vigour and allow the crop to replace damaged flowers.

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**Alfalfa Weevil**

***Hypera punctata* (Coleoptera: Curculionidae)**

**Distribution:**

This insect is native of Europe, but has long been present in North America and is now established in most areas where clover and alfalfa are grown.

**Host plant:**

Alfalfa and clovers occasionally infest bean, wheat and corn.

**Damage:**

The larvae initially feed within the leaf buds and then move to the tips of the plant. Damage starts out as pinholes, and progresses to larvae feeding between the leaf veins, heavy infestations of larvae can consume enough foliage that can result in severely (shredded) or skeletonized leaves that give the field a grayish white appearance. Adult weevil feeding damage is usually minor, taking the form of small, circular cuts along leaf margins.



### Life cycle:

The larva spend the winter in the soil near the crowns of plants and emerge early in the spring, climb the plant and feed on foliage, full development in April or May, the larvae spin cocoons on leaves, in soil, or among debris and pupate for 11 days, from May to July, the nocturnal weevils emerge and feed only a short time before becoming inactive. In September and throughout the fall, beetles resume activity and deposit egg on leaves, in hollow spaces of old stems. Most eggs hatch in the fall, but a few eggs overwinter.

Beetles which fail to lay eggs in the fall, deposit them the next spring.





**Control methods:**

- 1- Favorable fertility conditions
- 2- Rotation of clover or alfalfa regularly with grass crops
- 3- Favorable humus level which promotes moisture retention.