Lecture 04

5- Hessian fly

Phytophaga destructor (Diptera: Cecidomyiidae)

Distribution:

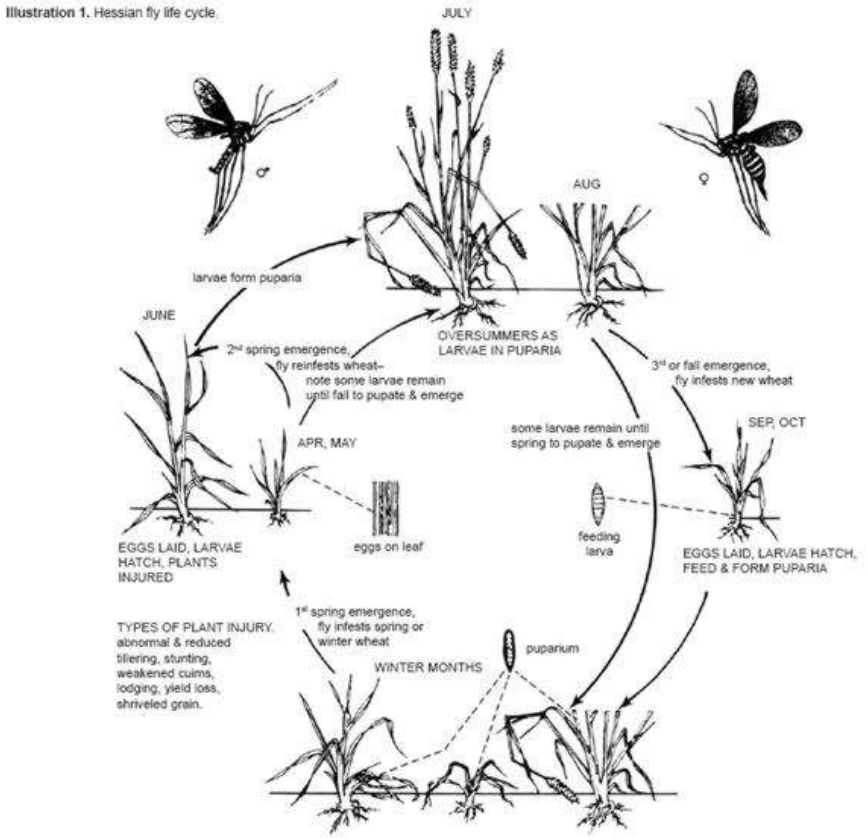
Distributed in North America from Europe, Occur in United States, North and South Carolina, Georgia, Iraq, Palestine, Syria and Turkey.

Host Plants:

Wheat is the principle host plant of the Hessian fly. It may also be found on barley and other wheat related species.

Life Cycle:

Typically, **Hessian flies** complete two generations per year. The **pupae** overwinter within puparia, the hardened skins of the last instar larvae. These puparia, known as the "flaxseed" stage, are located just below the surface near the crown of the plant. **Maggots** hatch from the **eggs** in 3 to 7 days, crawl down the leaves, and feed at the crown or joints along the stem. The maggots develop through three instars over a 25 to 30 day period, enter the flaxseed stage before harvest, and pass the summer in the stubble. In late August or September, second generation flies emerge and deposit eggs on wheat or early-sown winter wheat.



Control Methods:

The Hessian fly can be successfully managed with cultural and biological control methods. The state agricultural extension service will provide the names of wheat varieties resistant to the particular races of the Hessian fly which occur in any localized area.

In areas of annual infestation, it may be beneficial to rotate crops so that wheat is not grown on the same land two years in succession. This practice reduces Hessian fly populations as well as those of other insects attacking small grain crops.

6- Wheat Stem Sawfly

Cephus pygmaeus (Hymenoptera: Cephidae)

Distribution:

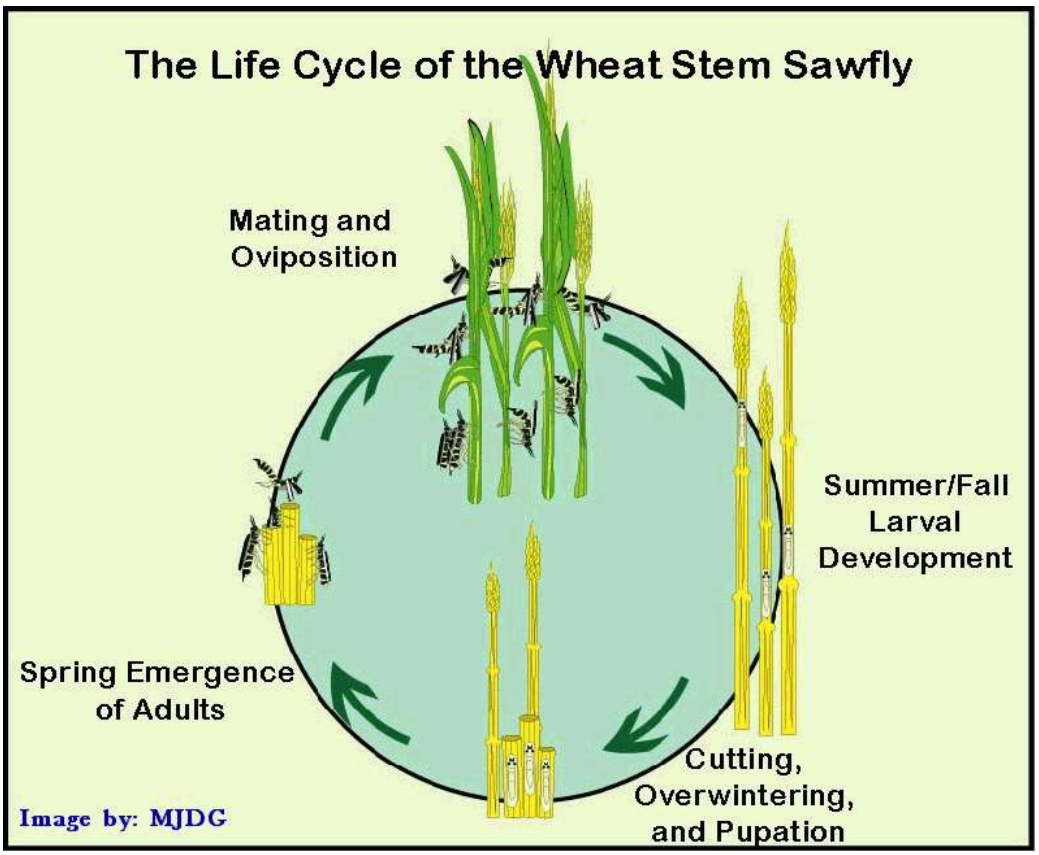
Occur in United States of American, North Africa and Iraq.

Host Plants:

One of the most economically important insect pests of winter and spring soft wheat; also causes damage to winter and spring barley.

Life Cycle:

Eggs are laid singly in the stems of cereal plants, each inserted just below the ear. The egg hatches 7-10 days later. The **larva** then bores downwards within the pith and eventually, typically about a month later, reaches the base of the stem. The larva then bites around the wall of the stem to form a line of weakness, and plugs the hollow stem below this point with a tissue removed from the wall; the larva then spins a cocoon within which to overwinter. **Pupation** occurs in the spring. **Adults** occur from late May or June to July. They are often found in the vicinity of cereal fields, where they forage for pollen on various plants.



Control Methods:

Control measures include harvesting as early as possible; use of resistant varieties with "filled" stems; and growing of less susceptible crops (oats, millet). Treatment by chemicals during the period of adult flight is ineffective; burning out of stubble does not substantially influence the larval death rate, but it does promote higher levels of entomophages mortality.

7- Cereal Leaf Miner (Rice Whorl Maggot)
Hydrellia griseola (Diptera: Ephydridae)

Distribution:

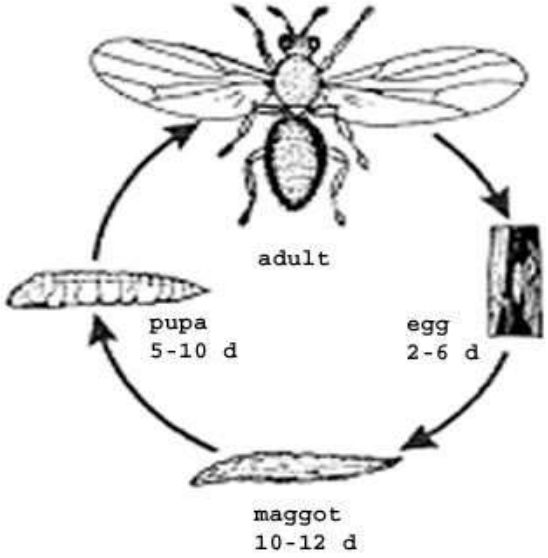
Found throughout Europe (not UK) and Asia, North Africa, Egypt, Malaysia, China, Korea, Japan, USA and South America.

Host Plants:

(Main) = Wheat, barley, oats. (Alternative) = Rice, and many species of grasses and some aquatic plants.

Life Cycle:

Eggs are laid singly on the leaves; each female laying 50–100 eggs. Hatching takes 3–5 days. On hatching the maggots immediately bore into the leaf tissues; the feeding tunnel is initially a linear mine but soon coalesces into a blotch (whorl). **Larval** development under warm conditions takes 7–10 days, but is recorded as being as long as 40 days in northern regions. **Pupation** takes place within the mine and the brown puparium is clearly visible; the pupal period is 5–40 days according to temperature. The **adult** is a small grey fly with long legs (like a small house fly), with a shining grey; wingspan 2.5–3.2 mm; males are the smaller. Females start egg laying three days after emergence, and can live for 3–4 months. In the warmth of California there are 11 generations per year, but in northern Japan there are usually eight generations.



Control Methods:

The usual treatment when control is really necessary has been foliage sprays of dieldrin or heptachlor, which kills both adult flies and the mining maggots.

8- Corn Stem Borer
Sesamia cretica (Lepidoptera: Noctuidae)

Distribution:

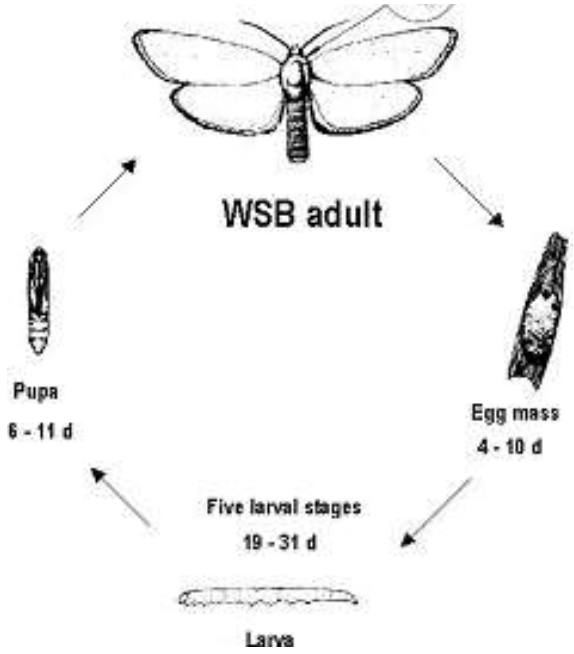
Most of tropical Africa. Several other species of *Sesamia* also occur widely in Africa on the same range of host plants.

Host Plants:

(Main) = Maize, sorghum, millet, rice, and sugarcane. (Alternative) = Various species of wild grasses.

Life Cycle:

Eggs are laid on the leaf sheath in groups of up to 40. They hatch a week later and the **larvae** immediately start boring into the stem. The larval period is 6–7 weeks. The **mature caterpillar** is about 30 mm long and 3.5 mm broad, with a brown head and body with pink dorsal markings. The **pupal** period lasts about ten days. The **adult** moths are pale with darker markings on the forewings; the male is smaller (22–30 mm wingspan) than the female (24–36 mm), and the hind wings are white. The total life-cycle takes 30 days for completion, according to climatic conditions.



Control Methods:

Cultural control measures such as weeding, crop hygiene, removal of alternative hosts in the vicinity of the crop, do help to lower the pest populations.

Natural enemies: The main parasitoids are egg parasitoids, especially *Telenomus busseolae* and the larval ectoparasitoid, *Bracon brevicornis*.

The **chemical control** measures are also recommended.