

## Lecture 02

### Common Insect Pests (Multiple Family Insects)

#### 1- Desert Locust, *Schistocerca gregaria* (Orthoptera: Acrididae)

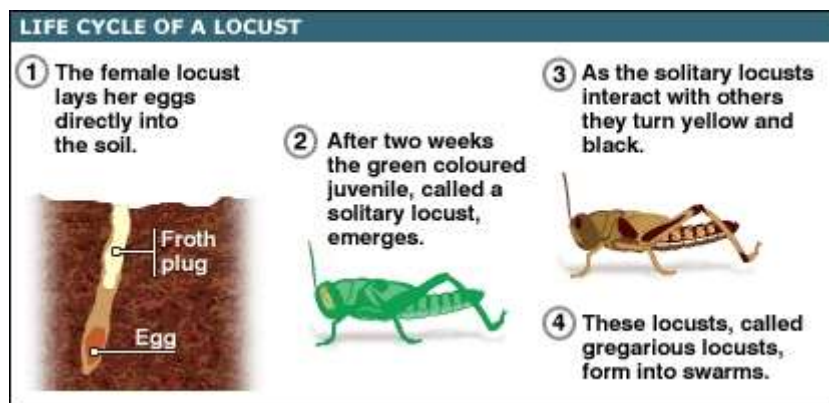
**Distribution:** It occurs in Africa through the Middle East to India and Pakistan. *Schistocerca cancellata* is important in Southern America, and *S. piceifrons* is the Central American Locust.

**Host Plants:** Polyphagous with some preference for Gramineae.

#### Solitary & Gregarious Phases

Desert locust in the **Solitary Phase** live apart from each other. The hoppers do not gather together or move about in bands. The adults fly singly at night. The females lay pods with 95-160 eggs and the nymphal stage passes through six instars.

In the **Gregarious Phase** the hoppers with their characteristic black markings come together in groups which join up with other groups to form large bands in which the insects move together in a single direction with the greatest density at the head of the bands. In this phase the hoppers pass through five instars.

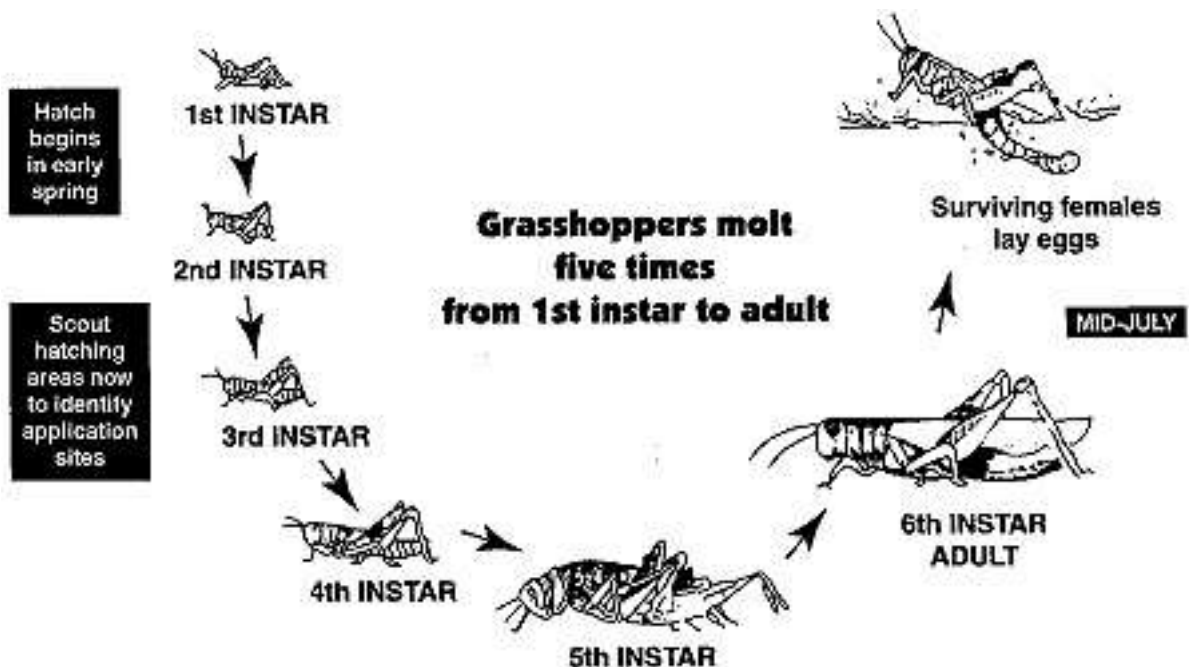


**Life Cycle:** After reaching sexual maturity, which is associated with the onset of the rainy season, and after being fertilized by males the females lay their eggs in the moist sand. The eggs are laid together in groups in egg pods (3-4 cm in length). Swarming locusts can lay up to three egg pods each containing 50-80 eggs.

In order to develop, the eggs have to take up moisture from the soil (at least 20 mm), and thus nymph can only hatch from the eggs laid in the soil. If the

necessary soil moisture is lacking, the eggs are able to survive a dormant period of up to 60 days. Egg need an incubation period, the length of which depends on the temperature and soil moisture: 10-14 days in the summer breeding regions of West Africa and on the Red Sea; 25-30 days in the cooler spring breeding regions of Central Arabia, Southern Iran and Pakistan; and up to 70 days in the cooler regions of North Africa.

The emerging nymphs, usually called hoppers, have a distinct black and yellow pattern, undergo five nymphal instars and take about 32 days to reach the fledgling or immature adult stage. The fledglings are still restricted in their activities to walking and short, downward flights. The total period from egg to adult is thus on average 44 days. The life span of an individual adult varies, but the duration of the life cycle in the field is known to be between 2<sup>1/2</sup> and 5 month.

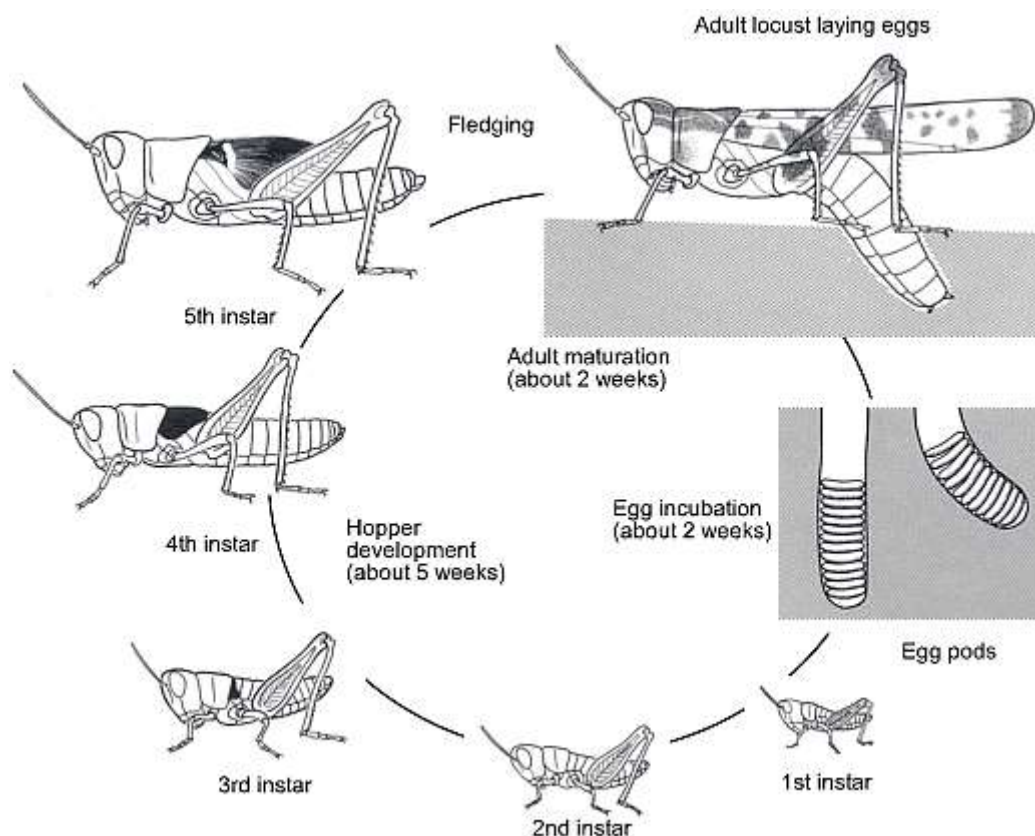


## 2- Egyptian Grasshopper, *Anacridium aegyptium* (Orthoptera: Acrididae)

**Distribution:** It occurs in Africa, Asia, Syria, Lebanon, Palestine and Egypt.

**Host Plants:** The grasshoppers which damage crops are general feeders. They have been known to cause losses in small grains, corn, alfalfa, soybeans, cotton, clover, grasses, and flax.

**Life Cycle:** Eggs are laid in the spring just under the soil surface. The growing grasshoppers will undergo several moults during their first months; in the early stages the wings are visible only as tiny wing buds that enlarge gradually at each moult. Egyptian Grasshoppers can be found in a variety of habitats preferring warm dry areas of scrub land and areas with trees, including orchards and gardens; their diet consists of various leaves and a single insect will cause very little damage. They spend a lot of their time hiding amongst foliage and branches of shrubs and trees, and when they catch sight of you they will move slowly to the far side of their ‘perch’, hoping you have not seen them.



### Control Methods:

- **Cultural control:** Good kills of eggs can be achieved by cultivating the egg beds before the hoppers hatch.
- **Natural enemies:** A wide range of parasitoids and predators attack different locust stages. The fungus *Metarhizium anisopliae* is used successfully against *Locusta migratoria* in Australia.
- **Chemical control:** Generally, locusts are not worth trying to control with insecticides. The long-term damage they do to cane is usually small and infestations die out within a couple of generations. Because hoppers usually group together, they are easier to spray than adults. Barrier spraying with persistent insecticides such as dieldrin can be very successful.

### 3- Mole Cricket, *Gryllotalpa gryllotalpa* (Orthoptera: Gryllotalpidae)

**Distribution:** Cosmopolitan in the warm regions of the World; comprising Africa, Mauritius, Egypt and Asia.

**Host Plants:** A general pest attacking many herbaceous crops, especially at the seedling stage.

**Life Cycle:** The female mole cricket may construct three or more of chambers and lay a total of about 100 eggs distributed between them. Eggs hatch after two or three weeks. Subsequent instars live in burrows during the day and forage for food on the soil surface at night. There are 9–11 instars and the total nymphal period lasts for ten months. Mating takes place about ten days after the last moult and egg-laying begins one or two weeks later. Eggs are laid in the rainy seasons, and as the total life-cycle takes about a year, there are probably two overlapping generations present in the field. Adults live for at least two or three months.



#### **Control Methods:**

- **Natural enemies:** Various species of amphibians, reptiles, birds, mammals, insects and spiders prey on mole crickets.

- **Chemical control:** Because of its underground habits, control is difficult and not usually cost-effective. If treatment is warranted, baits (such as those used for grasshopper control) or insecticides are recommended.

#### **4- Click Beetle, *Agriotes lineatus* (Coleoptera: Elateridae)**

**Distribution:** Click beetles live throughout the world, in nearly every terrestrial habitat. Scientists have described over 10,000 species, including almost 1,000 in North America.

**Host Plants:** Field crops, vegetable crops and ornamental plants.

**Life Cycle:** Adult click beetles are active from April to June. Eggs are then laid in the soil in batches of up to 100, usually amongst grass or other vegetation. The eggs hatch 5-6 weeks later. Wireworms (larvae) develop slowly, especially in their later instars, development usually extending over 4 or 5 years. They cause most damage in early spring, especially from March to May, with a second period of activity in the late summer or early autumn. Pupation takes place in August of the final year of larval development, each larva first forming an earthen cell 10 cm or more below the surface. The adult stage is reached 3-4 weeks later; however, the beetle does not emerge but remains within the pupal cell until the following spring.

#### **Control Methods:**

- (1) Clean cultivation and the destruction of weed hosts.
- (2) Hoe regularly to render soil conditions unfavourable to the larvae.
- (3) Roll seed beds before sowing to consolidate the ground.
- (4) Apply a dressing of lindane or aldrin worked into the top 4 inches of soil.

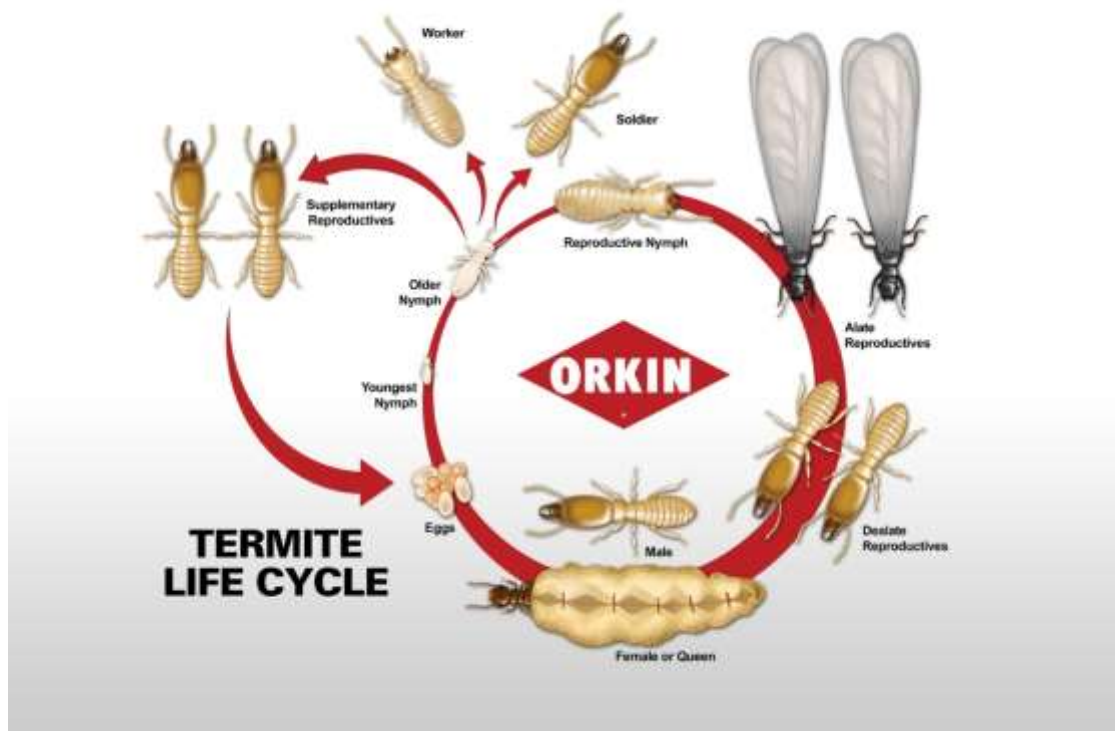
#### **5- Termites, *Microcerotermis diversus* (Isoptera: Termitidae)**

**Distribution:** Termites are found in all zoogeographic regions of the world and many oceanic islands (Southern Columbia, Southern Chile and South Island New Zealand).

**Host Plants:** A polyphagous pest recorded attacking a wide range of crops, both as seedlings and as grown plants; such as sugarcane, coconut and tea are attacked by several species.

**Life Cycle:** The life cycle of the termite begins with a mating flight, where in established colonies experience winged reproductive males and females leaving, and swarming and then going on to procreate. After fertilization, winged termites land and shed their wings, going on to form new colonies. These insects then become the king or queen termites of their newly-established colonies. The **queen** and **king** termites are the center of the termite life cycle and are solely responsible for reproduction. **Workers** are sexually and developmentally immature insects that are responsible for constructing tunnels and chambers as well as feeding and grooming other termite castes.

**Workers** and **Soldiers** live approximately one to two years. Queen termites may survive for up to 50 years under optimal climate conditions.



### Control Methods:

Termite control is required then aldrin and dieldrin, either in baits, or applied directly to the nest holes, were the most effective pesticides for many years, but now other chemicals are used.

Termite control is most regulated in North America, Europe, and Australia. However, in many countries controlling termites is achieved by the

hand removal of queens and nests, flooding nests, or drenching them with used motor oil.

Surveys of pest control firms in the United States reveal that poor building practices, particularly wood in contact with soil and cracks in concrete foundations, lead to many of the subterranean termite infestations.

Chemicals (including green products), heat, freezing, microwaves, and electricity are used for localized or spot treatments of dry-wood termites.