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Locust Life Cycle and Their Management

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SUMMARY

Locusts and grasshoppers are among the most dangerous agricultural pests. Their control is critical to food security worldwide and often requires governmental or international involvement. Although locust and grasshopper outbreaks are now better controlled and often shorter in duration and reduced in extent, large outbreaks, often promoted by climate change, continue to occur in many parts of the world. While some locust and grasshopper control systems are still curative, the recognition of the damage these pests can cause and the socioeconomic consequences of locust and grasshopper outbreaks have led to an increasing paradigm shift from crop protection to preventive management. Effective preventive management strategy relies on an improved knowledge of the pest biology and ecology and more efficient monitoring and control techniques.

INTRODUCTION

Locusts are a collection of certain species of short-horned grasshoppers in the family Acrididae that have a swarming phase. These insects are usually solitary, but under certain circumstances they become more abundant and change their behaviour and habits, becoming gregarious. No taxonomic distinction is made between locust and grasshopper species; the basis for the definition is whether a species forms swarms under intermittently suitable conditions. Devastating locust invasions have been recognized as a major threat to agriculture and mankind since ancient times. The infestations of locusts which ravages vast areas of land under a variety of vegetation which affects wild plants, pastures, forests and cultivated plants at different stages vary greatly from year to year and from country to country resulting in heavy crop losses and also setting in motion a chain reaction with far reaching effects such as famine, disruption of trade, abandonment of cultivation, diversion of labour, heavy expenditure on control measures and so on.

Cycle of Locust

Breeding regions

The pest breeds during the soring season in the costal and other areas of West African countries like Parsia where the winter rains bring about the required degree of soil moisture and vegetation. The adults emerging from this breeding stage migrate eastward to Pakistan and India by about the beginning of the monsoon.

The Egg – Stage 1 –

After fertilization, the female locusts usually lays her eggs inside holes made in warm, damp soil or sand known as pods. The female locusts produce a froth-liquid that encloses the eggs which ensure hydration and protection from predators. After this, the eggs undergo further development and enter the nymph stage.

The Nymph – Stage 2 –

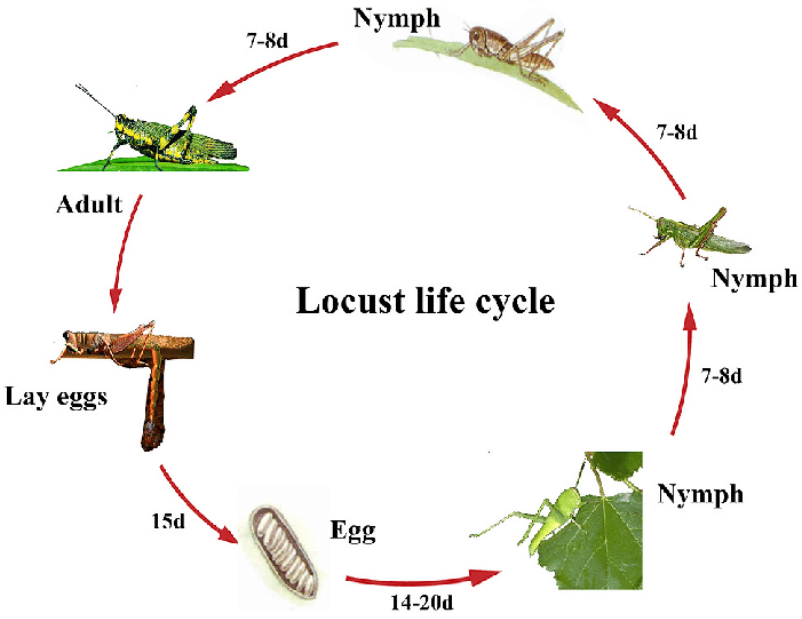
After 10 days to two weeks of egg-laying, the eggs hatch and nymphs come out. These newly hatched locusts are called hoppers or nymphs. Gradually as the nymph grows, they shed their skin or moult five times. These moulting phases are known as instars. After the fifth instar, the nymph develops wings and reproductive organs.

The Fledglings – Stage 3 –

After the fifth moulting, even though the nymphs have fully grown wings, they are still soft and fragile. Due to this, the fledgelings are unable to fly yet. During this stage, the exoskeleton of fledgeling locust becomes harder. Fledgelings also consume large amounts of plants in order to conserve energy for reproduction and wing development.

The Adult – Stage 4 –

After about two weeks, the fledgelings become sexually mature. During this stage, the adult locust is mostly migrating and constantly feeding. Adult locusts tend to gather in large groups and invade green plants or crop fields. The life expectancy of adult locusts is around eight to ten weeks. During this the male and female locusts mate, the female locusts lay eggs and the entire cycle begins again.



Reasons of outbreak

In breeding regions there are regular showers of rainfall in both the rainfall belts, which brings about the required degree of soil moisture and vegetation. However, the strong winds do not scatter the swarms.

Nature of damage

Locusts are voracious feeders, each adult, consuming its own weight of vegetation daily. It is estimated that 1 sq. mile settled swarm contains about 300 tons of locusts. Biggest 300 Sq. miles swarm is on record. Similarly hoppers eat 6-8 times more than they're own weight. It has been assessed that in India during 1926-31 plague, the damage caused to crops, fodder etc., was about 10 crores of rupees and consequential loss due to premature death of cattle and other livestock was incalculable.

Management

Destruction of Eggs

Locating the egg laid areas is always important, then trench them round, so as to entrap the young hoppers as they move out after hatching. Even actual destruction of eggs on organised scale may be carried out by ploughing, harrowing and hand digging.

Hopper Control

The mechanical methods included entrapping making hopper bands in 2' x 2' trenches and burrying. The chemical method includes use of poison baits and dusting of insecticides.

Poison Baits

5% BHC or pairs green or sodium fluosilicate & 2 Dusting 5 to 10% BHC against hoppers 25 to 30kg/ha has seen found to bring a complete control of the pests. Aldrin 4% dust can also be effectively use.

Control of Adults or Winged Locust Swarms

During 5% or 10% BHC or 4% aldrin may be carried out to achieve better control when swarms are resting on the bare ground at night or in early morning can be beaten or swept up and destroyed. If they are resting on bushes or hedges, they can be easily burnt with help of flame throwers. When flying locusts are about to

descend in large swarms in cultivated areas, the best way to tackle them is to prevent then alighting by all possible methods, such as waving a white cloth, or creating a cloud of smoke, by burning refuse, etc., spraying with neem kernel suspension as a deterrent to the crop, has also been tried with success. Recently with the introduction of aerial application of insecticide like aldrin, the control of locust swarms has become easier. The advantages associated with aerial spraying are:

- Vast areas can be treated in relatively short time.
- The swarm in fight can also be treated.
- When swarms settle down in a particular area that area can be quickly covered by aerial application.
- The movements of swarms can be watched with ease.

CONCLUSION

The constant and significant progress of locust and grasshopper management toward being green, efficient, and precise can serve as a model for crop protection in general. However, the increasing constraints on broad-acre chemical pesticide use mean that to ensure continuing success, new methods must be discovered and implemented, and the effects of both chemical pesticides and their biopesticide alternatives on non target organisms and ecological systems investigated. While there has been an improved understanding of locust behavior (21, 109, 122), the precise role of pheromones and other semiochemicals needs to be clarified if they are to become useful tools in monitoring and control.

REFERENCES

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