

Integrated Locust Management

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SUMMARY

Locust is a type of insect in which family 'Acrididae', a group of insects 'Orthoptera' distributed worldwide, when it came to India, it came with 80 core group, a speed of 150 km per day, and reproduction 5 times a month. The common name of the locust is a short-horned grasshopper. It started for the first time in Africa then more found in Pakistan and Rajasthan. It is an herbivorous insect, that often increases 'greatly in number' and migrates long distances. Locusts are excessively greed they need a great quantity of food they can eat their own plant every day 1 km of a locust contains up to 80,000 adults each day they consume the equal amount of food for 350000 people. The lifespan of locusts is 90 days and it is lay eggs in the soil. Almost in the world, more than 10 species have been found. But in India, only 4 species have been reported. In which the first one of the Desert locusts, migratory locusts, Bombay locusts, and palm locusts constitute numerous kinds of locusts.

INTRODUCTION

Locusts are a species of insects that fall under the family 'Acrididae' and the order 'Orthoptera'. Locusts are found all over the world and look very similar to grasshopper insects. Very often the locusts are mistaken for grasshoppers. The characteristics of locusts vary depending on the species. For example, the *Locusta migratoria* known as migratory locust is found in grasslands of Africa, South Europe, Australia and New Zealand. Similarly, the South American locust known as *Schistocerca paranensis* is abundantly found in the central and southern parts of America. Swarms of locusts have ruined and destroyed agricultural crops worldwide. Locusts have caused periodic disasters in the recorded history of humankind. Up to now, locust disaster is still the biggest threat to the world's agricultural production has caused massive food crises, economic losses, and ecological disasters. This review represents an effort to summarize the basic information on the biology and ecology, damage, and economic impact of locusts, examine the recent developments in integrated locust management and make recommendations for future research.

Life Cycle of Locust :

1) 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.

2) The Nymph – Stage 2 :

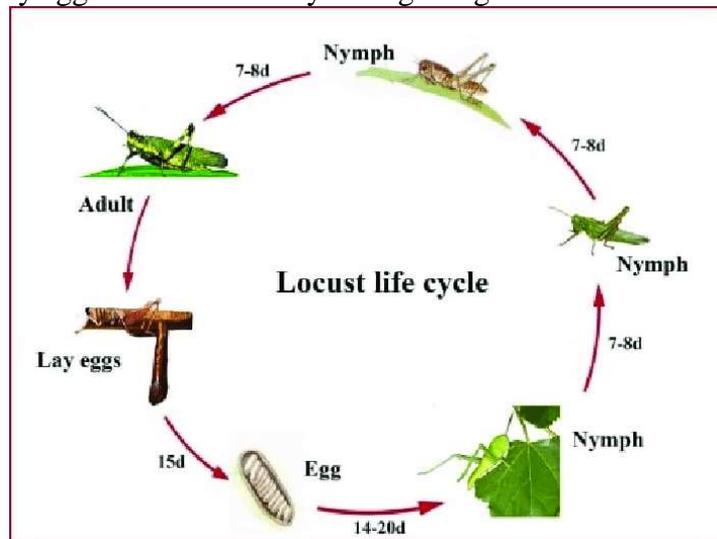
- After 10 days to two weeks of egg-laying, the eggs hatch and nymphs come out. These newly hatched locusts are called 'hoppers or nymphs'.
- Gradually as the nymph grows, they shed their skin or moult five times. These moulting phases are known as 'instars'.
- After the fifth instar, the nymph develops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

3) 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.

4) 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.



Different species of Locust :

Only four species viz. Desert locust (*Schistocerca gregaria*), Migratory locust (*Locusta migratoria*), Bombay Locust (*Nomadacris succincta*) and Tree locust (*Anacridium sp.*) are found in India. The desert locust is most important pest species in India as well as in intercontinental context.

Desert locust (*Schistocerca gregaria*) :

- Desert locust is troublesome insect pest in India. They have their origin from the crop.
- Numerous hopper bands were present in Senegal, Mauritania, Mali, Niger, and Burkina Faso, where a growing number of new swarms formed.
- The Sahel was drying out by the end of the month, and numerous groups were circling the area and the most harmful for the agricultural crop. This causes reduction of the crop and loss the quality.
- Thus, we can say that the reason desert locust very losses of products in India in this do not include agricultural products but also includes other products.
- Due to the swarms' ability to easily fly over vast distance, the desert locust is one of the dangerous of the locust pest during the plague years it has caused a widespread destruction to the crop because they are too moveable, they can go here and there and can eat a large amount of food and any kind of green vegetation crop plant fodder etc.



Migratory locust (*Locusta migratoria*) :

- The migratory locust (*Locusta migratoria*) is the most widespread locust species, feeding almost continuously if they can, and females produce and lay eggs in batches.
- It is estimated that the food and agriculture organization, according to the Food and Agriculture Organization, they are the world's most fatal wandering pests.

- The Migratory Locust is a large insect, with the body length varying from 60 to 75 mm for males and from 70 to 90 mm for females.
- It is said that FAQ is the most destructive harmful migratory pest in the world.
- The addition of the in powder at the different amount cause effect on it and give the information about have 5% nutritional quantitative and sensory in bread.
- Adult body 14 to 60 mm long and have fine hair on the chest. Nymphs can be dark.
- There are more effects of crops such as sorghum, sugarcane, forage, wheat crop, etc.



Bombay locust (*Nomadacris succincta*) :

- It is one of the most used pests in the eighteen and nineteen the one generation survive only for a year and the adult of it spend as immature adult in dry cool season while when the rain starts, they give birth to their kid in India more the 4 ponds have been discovering where egg has been laid which is about 606 eggs from 4 ponds.
- Whereas females in Thailand lay one to three egg pods holding 96 to 152 eggs.
- After lying, the adults quickly pass away.
- The timeline and degree of egg and hopper development are highly variable.
- Locust swarm is the migratory bird it can fly as far as about 150 km per day and it can about feed themselves about 2 grams of the crop while which is more in quantity of equal to their own weight.
- They destroy the crops and interrupt and cause damage to the entire agriculture production and consumption activity which is mostly said as locust plague which may result in hunger and famine.



Integrated Locust Management :

Although IPM programs may vary from one environment or situation to another in the specific elements, they are always the same in the basic components. IPM always involves forecasting, which provides the necessary facts upon which, together with economic injury level, to base decisions about whether or not to implement control procedures. When the decision to implement controls is made, the various control options have to be carefully selected in terms of their effectiveness and human and environmental safety. Additionally, care needs to be taken to ensure the compatibility of each control option.

- After harvesting the crop, many insects produce their eggs in the empty field, which matures when the crop is planted in the next stage and damage crops. So, we do deep ploughing so that the egg and larva of the insect can be destroyed like gross hopper.
- Sometimes insects live on the crop residue left after harvesting and they become hosts and affect other plants and the next crop. Therefore, the crop residual left after harvest should give the destroy reasons.
- Sometimes it happens that both the egg time of insect and planting time occurs. So, we should plant the crop according to the environmental condition and time.

- Fencing to prevent insects from moving from one place to another.
- Hopper dozes such types of traps are made for catching insect of a particular group.
- Use of insect growth regulators *viz.* diflubenzuron, triflumuron and diflubenzuron.
- These are currently the most widely used type of locust insecticides, e.g., fenitrothion, deltamethrin, lambda cyhalothrin, chlorpyrifos and bendiocarb.
- In locusts, oil from neem causes problems with development and diminished levels of youthful hormonal.
- As a last resort for crop safety dig a long narrow hole for the chipper to fall into or strike the roller with sticks.
- Farmers used to try to drive away the locusts by lighting fires.

CONCLUSION:

Locusts are the short-horned grasshoppers with highly migratory habit, marked polymorphism and voracious feeding behaviour. They are capable of forming swarms (adult's congregation) and hopper bands (nymphal congregation). They cause great devastation to natural and cultivated vegetation. They are indeed the sleeping giants that can flare up any time to inflict heavy damage to the crops leading to national emergency of food and fodder. Locusts have caused periodic disasters in the recorded history of humankind. Up to now, locust disaster is still the biggest threat to the world's agricultural production has caused massive food crises, economic losses, and ecological disasters.

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