



Locust Swarm and its Management



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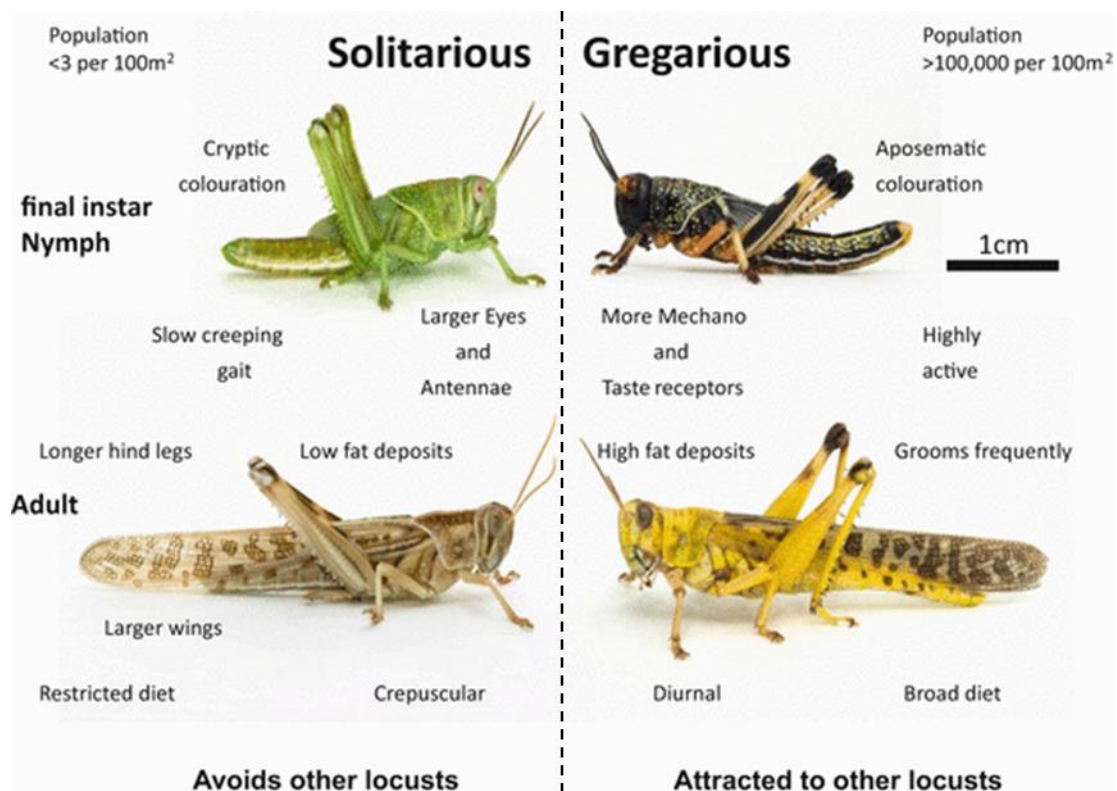
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What are locusts?

Locusts are short-horned grasshoppers in the family Acrididae that have a swarming phase. There are 19 locust species in the world and among them the desert locust (*Schistocerca gregaria*) is the most dangerous. These insects are usually solitary, but under certain circumstances they become more abundant and change their colour, behaviour and habits, becoming gregarious to form swarms. Usually one swarm contains billions of insects per square kilometre which has the capacity to eat everything that falls in its flight path.



Pic from "The Neurobiology of a Transformation from Asocial to Social Life During Swarm Formation in Desert Locusts by Stephen M Rogers".

How many species of Locusts are there in India?

Four species viz. Desert locust (*Schistocerca gregaria*), Migratory locust (*Locusta migratoria*), Bombay Locust (*Nomadacris succincta*) and Tree locust (*Anacridium* sp.) are found in India. Among them the desert locust is the most dangerous species in India as well as in intercontinental context.



Desert Locust



Migratory Locust



Bombay Locust

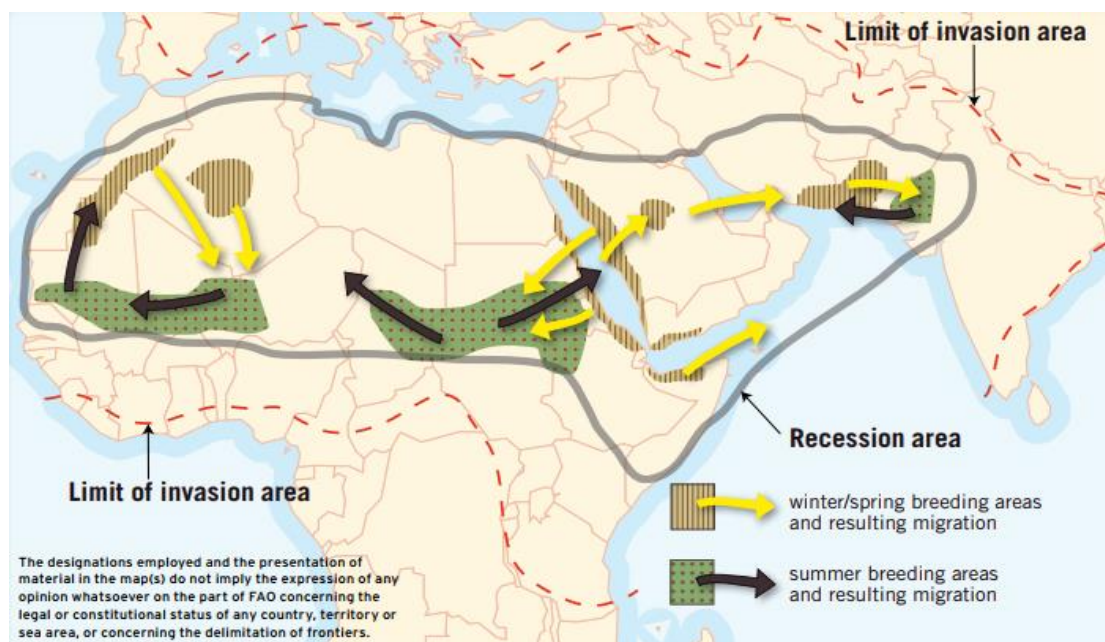


Tree Locust

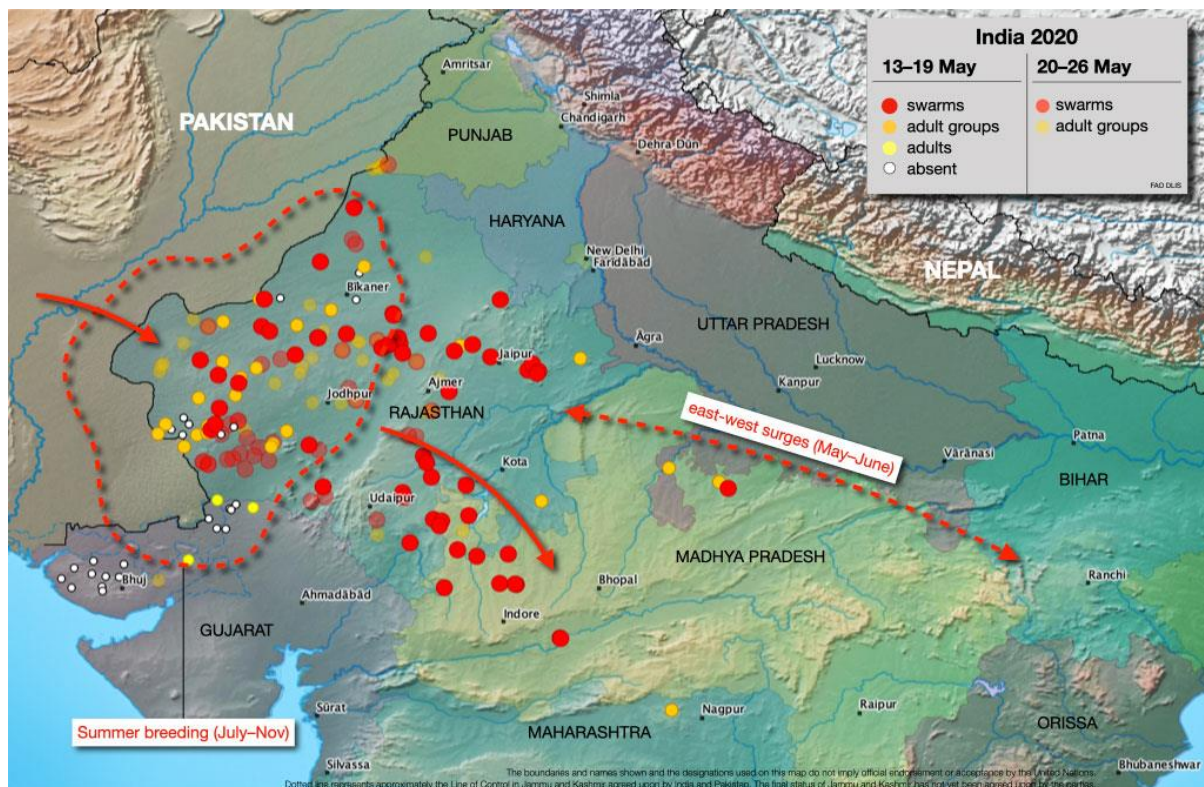
Pic from Directorate of Plant protection, Quarantine and Storage.

From where these locusts come?

There are many breeding areas for these locusts in Africa, Middle East and India. The swarm that invades India originates in the desert of Pakistan or Arabian Peninsula which are carried to India through monsoon winds. Every year a Government organisation called Locust Warning Organization (LWO) usually monitors and destroys their breeding grounds. But this year climate change effect and unexpected cyclones in the Arabian Peninsula have aided their rapid multiplication and spread.



Pic from FAO Emergency prevention system Desert Locust Bulletin.



Pic from the FAO Locust Watch website showing the recent locust activity in India

How much they can eat?

Each grasshopper can eat 2-3 times more of its body weight per day. A very small swarm of 1 km² can eat the same amount of food in one day as about 35 000 people. Bigger swarms eat everything that is green causing complete destruction.

How long locust swarm lasts in a given place?

It usually 17-24 hrs, but if the winds are strong, locusts tend to move to next place before that. A single locust can fly up to 3000 miles in its lifetime. These swarms always tend to move within a delimited area. In India this area falls under two states: Gujarat and Rajasthan and generally do not go beyond that.

How to control Locust Swarm?

It is usually very difficult to control a locust swarm because of its huge population density. It is estimated that even a very small swarm of 1 km² contains around 1 – 1.5 billion insects and any control measures will be futile against such a large population. For any control measures to be initiated, it must be in a large area. Usually spraying of insecticides is taken with helicopters and aircraft sprayers. However, if swarm is small and has a very low density

(usually borders of the swarm). In such cases local/ isolated control measures might help. The following are the control measures that are adopted for locusts.

1. Mechanical methods – digging trenches, beating and burning

2. Baiting – scattering locust food (carrier) impregnated with insecticide. Studies have shown that the best carriers for locust bait are maize meal, wheat bran, maize bran, cotton seed husk and rice bran. The ratio of the carrier to insecticide is 20:1. For instance, 20 kg of wheat bran (or other selected carrier) and 1 kg of 1% bendiocarb dust or 3ml of Fipronil 5 SC can be used as killing agent. Bait can be used to kill both hoppers and settled adults but its main use is against hoppers. It can be used against all hopper instars but gives very poor results during the last 2-3 days of the fifth instar and during all moulting periods. It is particularly useful for control of marching bands when there is little annual vegetation and much bare ground. Baiting is effective against adult locusts settled on the ground. For example, in the morning before take-off, and is one of the safest methods to use amongst crops. Efficiency of baiting will be improved by spreading the bait actually amongst the hoppers. They only eat bait if they find it in their path. They are not attracted to it from a distance. Disturbance caused by walking through them is only temporary. Spread the bait thinly and evenly so as to allow the maximum area for the hoppers to feed. Do this by throwing it high in the air and letting it drift with the wind. Do not be afraid that the wind will separate the insecticide from the carrier; this does not seem to happen with well-mixed bait. Do not spread bait when the hoppers do not stop readily to feed, since this usually means that the ground is too hot or the hoppers are near to moulting.

3. Dusting – applying a fine dust impregnated with insecticide. The most suitable insecticidal dust for killing locusts and grasshoppers is bendiocarb. Dust can be applied by hand and while doing so it is advisable to use a dusting bag or to mix the commercial product with fine sand to give a better distribution. One handful of insecticide dust to four handfuls of dry sand or silt. Dusting gives good results against the first-instar hoppers in dense groups, particularly as they hatch and hoppers marching slowly through dense low vegetation on which they feed. Some of the insecticide dusts used for control of Locust are:

1. Fenvalrate 0.4 DP
2. Malathion 5 DP
3. Quinalphos 1.5 DP

4. Spraying insecticides – liquid insecticide is sprayed either on locusts or on the vegetation they will consume. Control measures in such a situation are

1. Insecticide Dusts:

2. Insecticide Sprays

Sl.No.	Chemical	Dose/Ha	Toxicity
1	Bendiocarb 80 WP	125 g	Extremely toxic
2	Chlorpyrifos 20 EC	1.2 L	Highly toxic
3	Chlorpyrifos 50 EC	480 ml	Highly toxic
4	Deltamethrin 2.8 EC	450 ml	Highly toxic
5	Deltamethrin 1.25 ULV	200 ml	Highly toxic
6	Diflubenzuron 25 WP	240 g	Highly toxic
7	Fipronil 5 SC	125 ml	Highly toxic
8	Fipronil 2.92 EC	216 ml	Highly toxic
9	Lamda cyhalothrin 5 EC	400 ml	Highly toxic
10	Lamda cyhalothrin 10 WP	200 g	Highly toxic
11	Malathion 50 EC	1.8 L	Moderately toxic
12	Malathion 25 WP	3.7 kg	Moderately toxic

Precautions to be taken:

1. Farmers should form groups and monitor the field at night. Between 7 and 9 in the evening, millions of these insects can land in the fields to rest.
2. Dig large ditches around the field, and play loud instruments. In ditches apply insecticide dust.
3. In the evening / night, locusts congregate on trees and shrubs.
4. As a preventive measure, the neem-based insecticide Azadirachtin 1500 ppm 5 ml per litre should be sprayed on crops.
5. Spraying should be done late at night or early in the morning if possible. In this case, locusts gather in large numbers on the bushes to rest. Spraying on them gives a lot of control.

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