

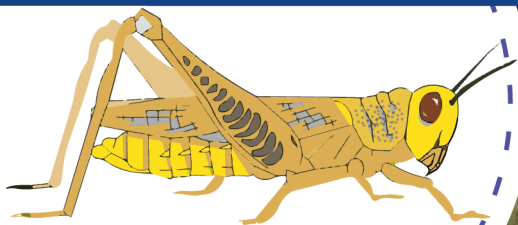
what are

LOCUSTS ?

Locusts are member of the grasshopper family Acrididae, which includes most of the short-horned grasshoppers.

Locusts differ from grasshoppers because they can change their behaviour and physiology in response to changes in density.

classification of LOCUST



Class
Order
Suborder
Superfamily
Family
Subfamily
Genus
Species

Insecta
Orthoptera
Caelifera
Acridoidae
Acrididae
Cyrtacanthacridinae
Schistocerca
gregaria

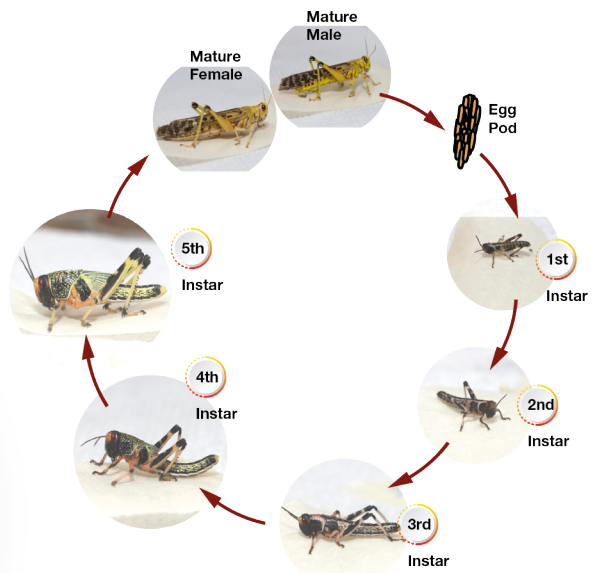


There are about 20,000 species of grasshoppers worldwide
Short-horned grasshoppers are about 10,000 species worldwide

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Identification of
desert locust

biology and behavior



-Like all other locusts and grasshoppers, the desert locust has three stages of development : egg, nymph (hopper) and adult.

- Eggs hatch into wingless larvae or nymphs called hoppers.

Adults do not moult and therefore do not grow in size but gradually increase in weight.

Adults that can fly are initially sexually immature, but eventually become sexually mature and can copulate and lay eggs.

Desert locusts can change their behaviour, physiology, colour and shape in response to a change in locust numbers.



Hoppers moult their skins five or six times, depending on their phases, each time growing in size. This process is called **moulting**. The stage between moults is referred to as an **instar**.

The final moult from the wingless fifth (or sixth) instar hopper to the winged adult is called **fledgling**.

The new adult, known as a fledgling, has soft wings that must dry and harden before flying.

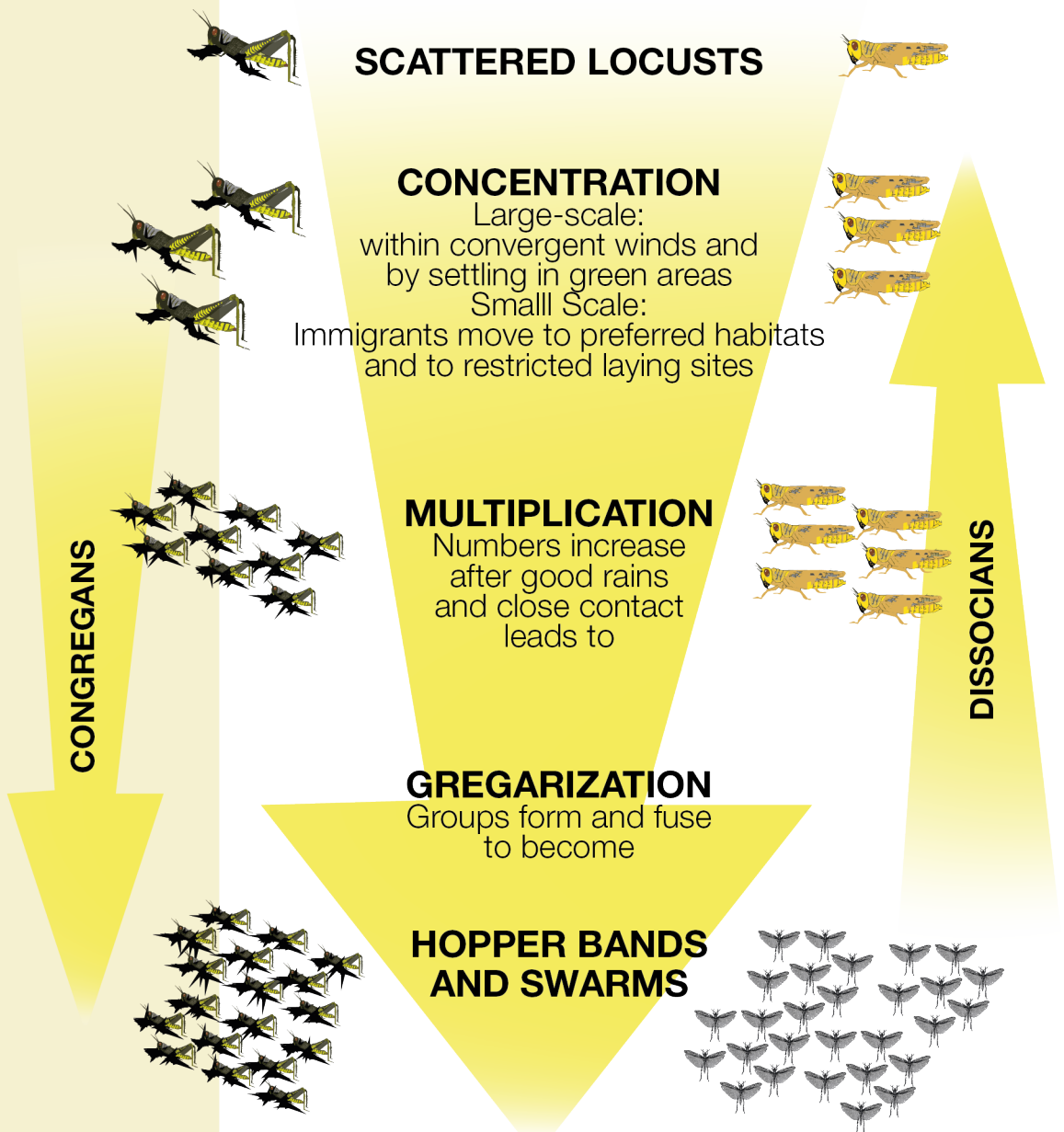




At low numbers, locusts behave as individuals (solitary phase);
at high numbers, they behave as a single mass (gregarious phase).



Three processes are involved in phase transformation:
concentration, multiplication and gregarization.





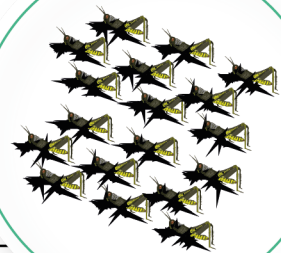
Hoppers hatch and pass through five or six instars. At the final moult, they develop wings and become young adults (fledglings).

When solitary hoppers increase in number, their behaviour changes, and they become concentrated and can form groups.



Solitary adult locusts are grey and groups (gregarious) of immature desert locust are pink in colour, while mature adults are bright yellow and have vertically striped compound eyes.

Shortly after hatching, hoppers form small dense black patches. These patches merge, forming larger bands. Hoppers in bands move together in the same direction.





On fledging, the adult's wings harden, and the adult remains immature until maturation is stimulated by rainfall.

When vegetation starts to dry up, solitary adults may become concentrated and form groups. This can occur during basking, feeding, roosting or flying. During this process, the adult's behaviour and colour change.



Locust adults and swarms do not always fly on the prevailing winds but instead may wait for specific types of winds to occur.



Swarms spend the night roosting in vegetation. At sunrise, they descend to the ground and warm up by basking in the sun. By mid-morning, swarms take off and will often continue flying until just before sunset when they land and feed.

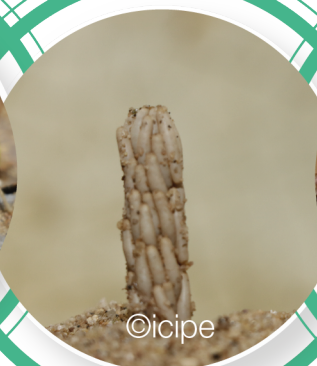
Within the recession area, locusts move with the winds. These bring them into particular zones during the summer and the winter/spring.



Desert locusts can migrate over long distances (100-150 kms per day) assisted by the wind. When breeding conditions are favourable, and desert locusts can quickly reproduce, increase in number and form one or many large groups called bands (hopper), or swarms (adults).



Desert locusts can feed on over 400 species of plants, most times completely destroying pasture and food crops.



The female uses the ovipositor to insert eggs into the sandy and wet soil with the valves at the rear of her abdomen and lays a pod of eggs. The pod is about 3-4 cm long and is laid about 5-10 cm below the soil surface, usually sandy soils. The rate of egg development is a function of soil temperature.

Therefore mortality can be caused by several factors.





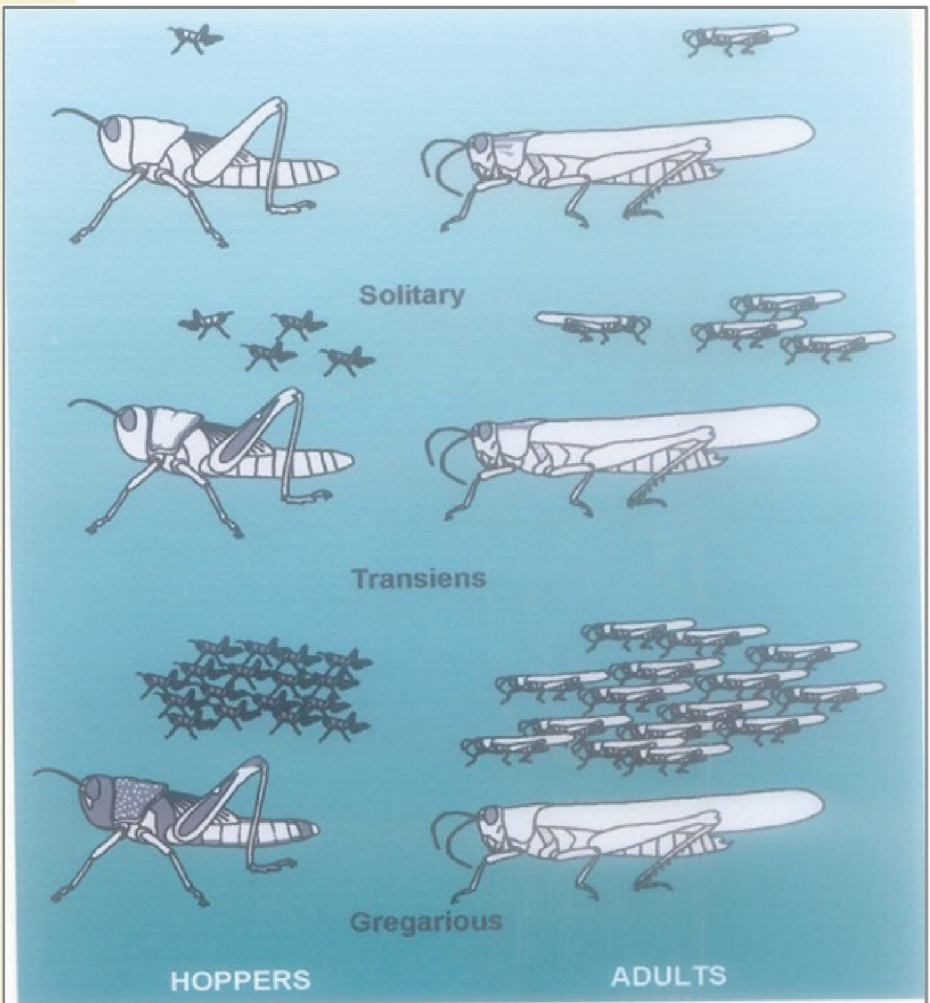
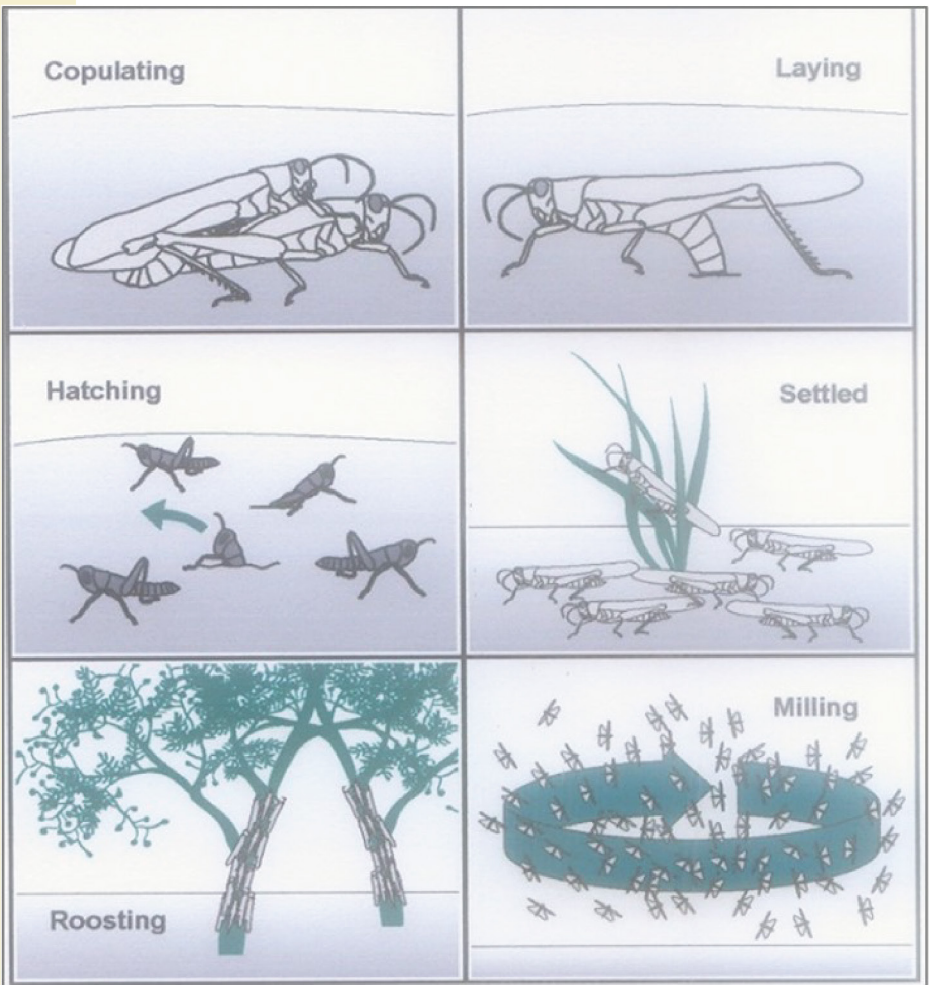
Flying swarm



Suspended on tree



Roosting on the ground





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Recessions, Outbreaks, Upsurges and Plagues

The desert locust usually is present at low densities in semi-arid or arid areas, away from major agricultural zones. Desert locusts do not cause significant crop damage, and hopper bands and swarms are rare or completely absent.

Outbreaks and upsurges characterize the transition from a recession situation to one of plague.

An outbreak occurs when there is an increase in locust numbers through concentration, multiplication and gregarization, which takes place over several months.

Upsurges

Upsurges are a result of successful breeding over many number of generations by an initially small population.

There are periods of one or more years during which there are widespread and heavy locust infestations, the majority of which occur as bands or swarms.



Successful management of desert locust outbreaks relies on regularly monitoring of their traditional (primary) breeding locations using surveillance equipment such as eLocust3.



Plant protection departments coordinate the overall locust management and should set up a monitoring and early warning system.



Countries prone to desert locust invasion should regularly monitor the weather, ecological conditions and locust developments and issue early warnings on a timely basis.



They should identify breeding areas and regularly issue desert locust growth and migration information as part of early warning and forecasting.



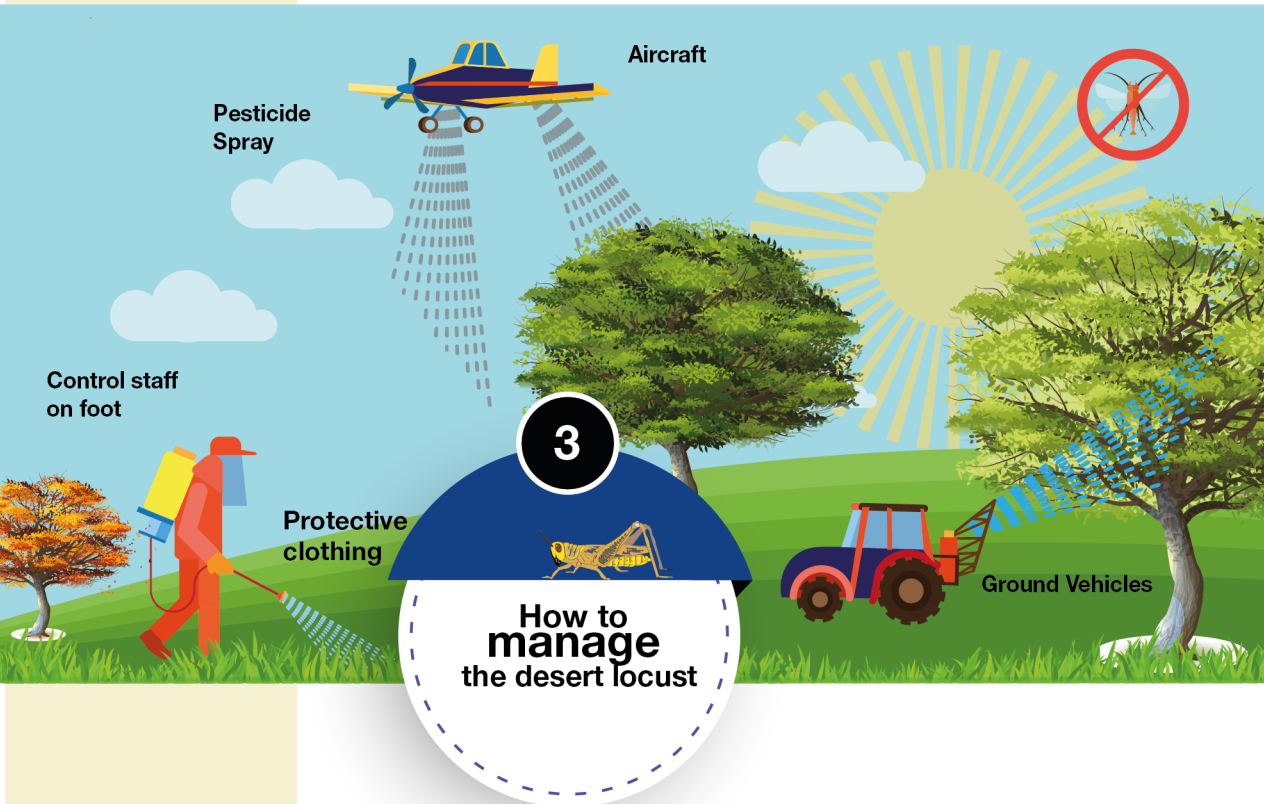
Designated telephone hotlines/SMS shortcode should be used to report swarms seen.



Capacity building and training of agricultural extension officers, desert locust scouts and sensitization of farmers on desert locust management, monitoring and early warning are essential. In addition, training on the use of existing survey and reporting mechanisms such as eLocusts should be conducted.



Satellite imagery can be used in monitoring changes in desert locust breeding habitats.

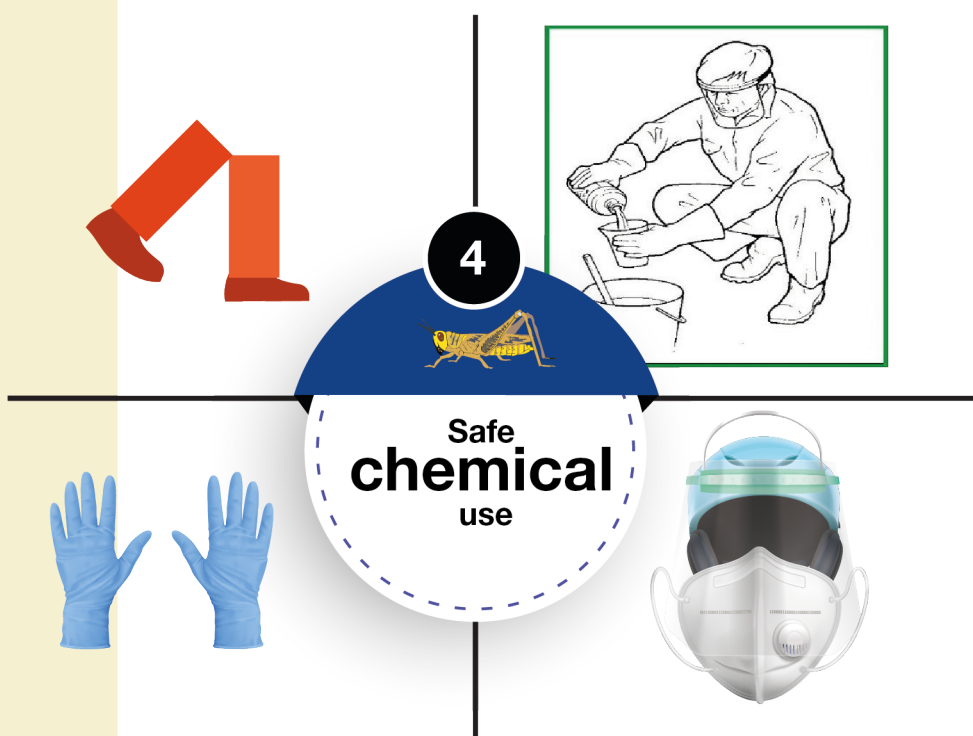


Effective desert locust management mainly starts through regular monitoring of their primary breeding locations, changes in the weather and ecological conditions that favour their developments, and and make analysis and forecasts.

- ✓ Cultural control techniques for managing swarms include digging to expose eggs and burning them.
- ✓ The scale and amount of resources needed in desert locust control requires coordination between the ministries of agriculture and other stakeholder's involved at county level.
- ✓ Desert locusts are best managed using different pesticides to limit their damage to crops. However, indiscriminate use of chemical pesticides could have harmful effects on other beneficial insects such as bees and wasps fish and even on the environment.
- ✓ Pesticides can be applied on the ground and/or by aerial spraying. Farmers can use knapsack sprayers which might reduce the population of locusts, but the most effective way to manage is via vehicle-mounted sprayers or aircraft.
- ✓ It is impossible to kill eggs because they are too deep in the ground to be reached by pesticides. However, if eggs are laid in unplanted fields, these fields can be ploughed to expose the eggs to sunlight, which kills them.
- ✓ Inform extension officers and government officials when you spot desert locusts so that the government can take quick action.
- ✓ Spraying can reduce the impact of swarms in the immediate area. However, early intervention (surveying and monitoring) is the most effective way to address continuous multiplication in the breeding areas that often results in new, and very likely larger, populations.
- ✓ To manage desert locusts in breeding areas, spraying with bio-pesticides is more sustainable. Biopesticides such as *Metarhizium anisopliae* have previously been applied successfully using ULV methods to control locust populations in breeding areas
- ✓ Some natural enemies, such as birds, lizards, insects, etc., are known to feed on desert locusts. However, it should however be noted that natural enemies are only effective in the management of desert locust if their population is low or when they are old and close to their natural death.
- ✓ Botanicals can also be experimented on locusts as they kill other insects.

Pesticide application could have adverse negative impacts on human and livestock health as well as the environment.

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Pesticides must be procured and managed centrally; an individual farmer should not purchase or apply pesticides unless they have been trained.



It is important to carefully scout for locust populations to ensure that spraying is targeted precisely at the locusts.



Individuals recruited to aid management efforts must be trained on the safe use of specific pesticides designated for managing and controlling desert locusts.



If spraying is happening in your area, inform your neighbours to stay away from the targeted spraying location.



Wait for the Pre-Harvest Interval (PHI) period to lapse before harvesting any crops in near areas that have been sprayed.









Wait a few days before grazing your livestock on pastures that have been sprayed.



DO NOT eat desert locusts after they have been sprayed with pesticides. Take precaution and prevent your livestock from feeding on sprayed desert locusts as well.





-  Use pesticides and formulations that are specifically recommended and registered to manage desert locusts in your area. Follow the directions on the product label.
-  Use the application method, equipment and personal protective equipment (PPE) recommended for the product.
-   Pesticides should be sprayed when adult desert locusts have settled on trees or are basking on the ground under appropriate weather conditions, (early morning and late afternoon are the best times to spray).
-  Only use trained personnel to apply pesticides for managing locusts.
-  Ensure safe disposal and/or recycling of pesticide containers.

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