Advisory on Locust Management

Locusts are a group of certain species of short-horned grasshoppers in the family Acrididae that have a swarming phase (Gregarious phase). These insects are usually solitary in their habit, but under favorable environmental conditions and abundant food availability; they change their feeding and breeding behavior and become gregarious and rapidly increase their population. Locusts are polyphagous during gregarious phase, eating all kinds of vegetation that they encounter. A female locust lays eggs in an egg pod primarily in sandy soils at a depth of 10-15 centimeters below the soil surface. A solitary phase female lays one egg pod that contain 150-180 eggs (on an average), whereas, a gregarious phase female lays 2-3 egg pods with 80-100 eggs per egg pod. Erratic and untimely rainfall in different Indian states has led to exponential increase in locust population. Non-availability of favourable edaphic and climatic conditions required for egg laying and further multiplication of locusts in hilly areas of Uttarakhand make them a minor threat for hill agriculture. However, changing climatic conditions like high temperature, erratic rainfall and good soil moisture may increase the locust infestation in hilly areas.

Scientific management of locusts aims at managing the egg stage itself by exposing the eggs to hot sun or predators by trimming off bunds before the crop season and summer deep ploughing in endemic areas. The eggs are also preyed upon by ground beetles, grubs of blister beetles, ants, crickets etc.

When the nymphs hatch from eggs they form swarms and start attacking the green vegetation. At this stage they are preyed upon by a large number of birds, reptiles, spiders, robber flies and small mammals. Tachinid flies, flesh flies and Scelionid wasps parasitize the nymphs and adults of locusts. The young locusts feed on low lying grasses and then shift to field crops. When insects are noticed in large numbers, proper management measures are to be taken to contain their increasing population over generations.

Based on experience, the following management measures are recommended for integrated management of locusts in endemic areas of damage.

1. Regular monitoring of the fields and keeping updates on locust swarm movement through TV, radio, newspaper and nearest state agriculture office.

2. Locating the egg laid areas (egg beds) and trenching around the area to entrap the young hoppers. Even mechanical destruction of eggs on community basis may be carried out by ploughing, harrowing and hand digging.
3. Attracting birds by installing bird perches (2 per nali) in the affected fields, as birds are very important predators of this pest.
4. Once swarm is noticed in the nearby fields, loud noises by beating drums, tin boxes etc. can help in pushing the locusts swarm out of the fields.
5. Adults can be picked directly from the foliage at night because they are sluggish.
6. Flame throwers can be employed for burning and killing the resting locusts at night time in non-cropped areas.
7. Spreading poisoned bait, for example rice or wheat bran containing insecticide, in the path of the migrating swarms of locusts. The insecticide acts as stomach or contact poison, thus killing the locusts feeding on food poison bait. The bait can be used only when the locality of the hoppers is known.
8. At present the primary method of controlling locust swarms and hopper bands is with vehicle-mounted aerial sprayers (referred to as ultra-low volume (ULV) formulation) and to a lesser extent by knapsack and hand-held sprayers by spray with following insecticides during night time.

Sl. No.	**Chemical name**	**Dosage**			**ml/litre water**
		a.i. (grams)/ha	**Formulations (gram or ml)/ha**	**Dilution in water (Litres / ha)**	
1.	Chloropyriphos 20% EC	240	1200	500	2.4 ml
2.	Chloropyriphos 50% EC	240	500	500	1ml
3.	Deltamethrin 2.8% EC	12.5	500	500	1 ml
4.	Deltamethrin 1.25% ULV	12.5	1000	N/A	N/A
5.	Diflubenzuron 25% WP	60	240	Need based	-
6.	Fipronil 5% SC	6.25	125	500	0.25 ml
7.	Fipronil 2.92% EC	6.25	220	500	0.45 ml
8.	Lambdacyhalothrin 5% EC	20	400	500	1 ml

9.	Lambdacyhalothrin 10% WP	20	200	500	0.5 gm
10.	Malathion 50% EC	925	1850	500	3.7 ml
11.	Malathion 25% WP	925	3700	500	7.4 gm

9. Foliar sprays of insecticides like deltamethrin or dicholorvos eventhough are very effective for the control but have to be under restricted use, owing to its persistence and toxicity.
10. Several organic insecticides like, Nimbicidine and NSKE (neem seed kernel extract) @ 3-5 ml per litre are recommended for repelling the locusts away from main crop as they act as feeding deterrents.

Farmers are advised to use protective gears while spraying of synthetic insecticides. Insecticide sprays should be rotated with other recommended chemicals in the subsequent sprays to avoid development of resistance in locusts against insecticides. It is also advised to follow CIB&RC (Govt. of India) recommendations on use of insecticides.