

Locusts Attack and Its Control by Soil Pesticide

Varsha Pandey

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Ph.D. Scholar, Department of Soil Science, G.B.P.U.A.T, Pantnagar, Uttarakhand

Corresponding Author: varshapandey.p93@gmail.com

Introduction

Locusts belong to the family *Acrididae*. These are collections of certain species of short horned grasshoppers. Taxonomically, there is no distinction between grasshoppers and locusts. The notable difference being, locusts have big hind legs that help them to jump or hop. Usually, they show a solitary lifestyle. But sometimes they become abundant and change their habit from solitary to becoming gregarious. This change in lifestyle is observed when there is abundant greenery as a result of rain after a period of dry spell. Under such conditions, locusts breed abundantly as a result of release of serotonin in their brain and they can sense one another around them. This is called the gregarious phase of locusts.



Fig. 1: The plague of locusts (Source: thehindu.com)

There are also various phenotypic changes in locusts during this phase which includes change in body size, colour, body shape and even change in size of the brain. This is what is called phenotypic plasticity i.e. ability of an organism to change in response to stimuli or inputs from the environment. It is also known as phenotypic responsiveness, flexibility or condition sensitivity.

Destruction to crops

According to FAO, locust swarms are now developing across East Africa, Yemen, Iran, Pakistan and India. These areas have been warned to be on high alert and their growth is threatening crops in India. Countries like Kenya, Ethiopia and Somalia, continue to face an “unprecedented threat to food security and livelihoods”. They fly very rapidly and in swarms of millions. They can remain in air for a long time and also cover huge distances. They can cause massive crop damage. According to an estimate, a swarm of locusts covering just a square kilometer could damage up to a 100 ton of crops daily. The Australian Plague Locust

Commission estimates that on an average, nymphs of locust can per day eat 100-450 mg of green vegetation and adults can eat 0.2 g of green vegetation per day.

Locusts eat green and tender tissues of any plant material ranging from rice, wheat, cotton, vegetables and others. In Indian states, locusts have caused a huge destruction starting from Rajasthan, Madhya Pradesh, Maharashtra and parts of Punjab, Haryana, Bihar and Uttar Pradesh. The whole crop is wasted if green tender parts of a crop are damaged. According to an estimate by FAO, a swarm of just 1 square kilometer can consume as much food as would be eaten by 35,000 people (or six elephants) in a single day.



Fig. 2: Destruction caused by locusts (Source: thehindu.com)

Control of locusts attack

The corona virus pandemic along with locust attack is posing a great challenge for the farmers who are battling the insects using sprayers, pesticides, and drones. Mostly countries are combating the locust attack by spraying organophosphate chemicals which are applied by vehicle mounted or aerial sprayers. In certain regions, drones are used for controlling it. The resource poor farmers are going out at night to battle against the insects wearing masks and some basic protective clothing. But, for a Hyderabad based farmer, spraying of chemicals was not acceptable. Padma Shree award winner Chintala Venkat Reddy is a very innovative farmer who uses organic techniques of soil and nutrient management. He does not use any chemical fertilizers, insecticides or fungicides in farming. He has received an international patent for his various techniques.

Reddy told that “One must understand the anatomy of insects like a locust to know what will attract them and what will repel them. Locusts do not have a liver so they cannot digest clay contents. If they don’t have anything to feed on in my field, they will avoid and deroute.” This was the basic principle used by him.

Procedure for making the soil pesticide

- From about two inches depth of the field, collect 15 kg of topsoil and completely sun dry it.



- Now, separately sundry 15 kg subsoil from four feet depth. This preparation should be done in peak summer months. This quantity can vary. But the ratio should be maintained at 1:1. We can dry the mixture in bulk and use it as and when required to spray. But the conditions must be completely dry for storage.
- Now, mix the topsoil and subsoil in 200 liters of water, once they are completely dry.
- After mixing it with the help of a stick, the mixture is allowed to settle for about half an hour till mud settles at the bottom.
- Now, filter the top water with a cloth or sieve and spray on the crop. Spraying should be done within four hours of the mud settling. The mud settled at the bottom need not be discarded. It can be reused as a root application for the crops.
- Spraying with this soil-based pesticide must be done at least once every 7 to 10 days. For vegetables, it should be done once every four days for best results.

Reddy told Telangana Today that, “Farmers can also spray water first and take the subsoil in dry form and sprinkle or distribute it like fertilizer. That will stick to the plants and also saves the sprayers from jamming”. Reddy had already experimented by spraying light muddy water on his grape plants. In about two days, the death of insects occurred and he also used it on other crops with equally good results.

Conclusion

In the middle of the corona virus pandemic, locust outbreak has cost a huge loss to the standing crops. It is a real threat to the economy of India and its effective control is the need of the hour. Keeping in view the current environmental state, integrated and environmentally safer solutions should be used to deal with the upsurge of these pests. For immediate control, soil pesticide spray is a viable option. But, for a longer term, the central government also needs to start certain schemes and policies that provide insurance to farmers, producers and local community dwellers against this uprising pest.