



NEEM: USES AND POTENTIAL IN ORGANIC FARMING

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ABSTRACT

De-oiled Neem cake has been utilized as a fertiliser by Indian farmers in their fields. Neem cake is a popular input because of its dual function as a fertiliser and a pest repellent. The leaves of the neem tree were also reported effective against economically important insect pests and diseases. The biopesticidal properties of this plant can be found in all sections of the plant, especially the leaf, bark, and root extracts. Azadirachtin, a biopesticide obtained from neem extract, can control various insect pests in agriculture. Although neem-based formulations may not kill insects directly, they can significantly alter their behaviour to limit crop pest damage and reproductive potential. The neem is considered an easily accessible, eco-friendly, biodegradable, cheap, and nontoxic biopesticide that controls the target pests.

INTRODUCTION

India is predominantly an agricultural civilization, with over a hundred million people reliant on agriculture for a living. The success of agricultural output remains crucial to the liberalised Indian economy, with agriculture accounting for 35 to 40% of India's national income. Chemical fertilisers and pesticides were unheard of, and livestock were an important part of farming. Albert Howard, a distinguished agricultural scientist, reported in the early twentieth century that Indian farmers employed compost and organic manures, which allowed them to cultivate on the same ground for over 2000 years without losing crops. He went on to say that the crops were pest-free and nearly as long-lasting as the prehistoric forest. Pest control in most developing nations today is primarily based on the use of imported insecticides. This reliance must be lessened. Although pesticides are often profitable in direct crop returns, their usage frequently results in environmental contamination, damage to beneficial insects and wild biota, unintentional poisoning of humans and livestock, and the twin concerns of pest resistance and recovery.

THE NEEM

Unlike conventional insecticides, neem components target the insect's hormonal system rather than the digestive or neurological systems, preventing future generations from developing resistance. These molecules are part of a group of natural products known as limonoids. Neem contains limonoids, making

it a safe and effective insecticide, pesticide, nematicide, and fungicide. Azadirachtin, salanin, meliantriol, and Nimbin are the most critical limonoids discovered in neem that have been shown to inhibit insect growth. Azadirachtin is nowadays assumed to be neem's primary insect-control agent. It looks to have a 90% effect on the pests. It repels and impairs insect growth and reproduction rather than killing them (at least not immediately). It has been confirmed to be the most effective growth regulator and feeding restrictive ever tested over the years.

USES OF NEEM EXTRACTS

1. Spraying of NKAE

- Crops should be sprayed with NKAE @ 1.25 per cent to 5 per cent.
- Spray the neem solution within the same day of preparation.
- The NKAE has a 7–10-day duration of action. It's important to make sure that all of the plant's leaves is covered in NKAE.

2. Neem Leaf Extract

- 1 kg of green neem leaf is needed to make 5 litres of water. Because the number of leaves needed to make this extract is rather large (about 80 kg for 1 acre), it can be utilised in nurseries.

3. Neem Cake Extract

- Mix one litre of water with 100 gm of neem cake to prepare neem cake extract. The neem cake is soaked in water and placed in a muslin pouch. Before using it in the morning, it is soaked overnight.
- Filter the water and add emulsifier @ 1 ml/l of water. After that, it can be sprayed.

4. Neem Oil Spray

- In 1 litre of water, 15-30 ml Neem oil is added and thoroughly mixed. (1ml/1litre) is added to this emulsifier.
- It need to sprayed as soon as the oil droplets begin to float by using a knapsack sprayer.



PRECAUTIONS

- Do not boil the mixture after heating and boiling the extract.
- Use a neutral pH emulsifier instead of an acidic or alkaline pH emulsifier.
- Sunshine's ultraviolet radiation - Spray in moderate sunlight;
- Water's hydrolysis - use an aqueous extract the following day.

NEEM AGAINST NEMATODE AND FUNGUS

Controlling these nematodes is challenging. Synthetic nematicides should not be used since they have toxicological consequences. Active protection/defence against root-knot nematodes is provided by

certain liminoid fractions isolated from neem kernels. Nematocidal properties are also seen in water extracts of neem cake. Cardamom farmers in south India are already using neem cake for commercial purposes.

Neem has been shown as a fungicide in several studies. The fungus *Aspergillus flavus* was not killed by neem-leaf extracts but entirely inhibited it from making aflatoxin. This is significant since aflatoxin is a potent carcinogen that has raised concerns about the world's food supply.

Table 1. The commercial product of neem

Fertilizers	Agrochemicals
Neem urea guard	Azamax
Parker neem coat	Neemix 4.5
Ozoneem coat	BioNeem
Ozoneem cake	AZA- direct
Neem cake	Neem oil
Plan "B" organics-neem cake	OzoNeem oil
Bio neem oil foliar	Neemazal technical

FOR PROTECTING STORED GRAINS

Neem oil treatment of jute sacks is ineffective and prevents pests such as weevils and flour bugs from penetrating. The pest-resistant properties of a mixture of neem leaves, clay, and cow dung can be employed to construct grain storage containers. In impoverished areas, post-harvest losses are infamously high.

IMPROVING THE SOIL FERTILITY AND FERTILIZER USE EFFICIENCY

Indian farmers have always used de-oiled Neem cake as a fertiliser in their fields. Neem cake is a popular input because of its dual function as a fertiliser and a pest repellent. The leaves of the neem tree have also been used to enhance soil. Neem seed cake is applied to crops to give them with a variety of nutrients.

CONCLUSION

Neem provides a suitable option for developing eco-friendly pesticides. Neem products are suitable for integrated pest management and nutrient management because of their nontoxicity behaviour. The judicious use of neem-based products may help increase crop productivity and maintain ecosystem sustainability.

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