

Neem: A Savior and Boon to Organic Farming

Swati Nadda and Vinod Bharti

Abhilashi University, ChailChowk, Distt.Mandi, H. P.

ARTICLE ID: 125



Introduction

Neem *Azadirachta indica* a native tree of India and the Indian subcontinent belongs to the family *Meliaceae* is a non-toxic, environmentally friendly, degradable plant and its derivatives are of great relevance in organic Agriculture. Before the introduction of synthetics, Indian villagers used neem derivatives to provide protection and in the nourishment of the crops. Apart from agriculture neem also has Medicinal use. Considered as the most promising tree of the 21st century and the Free tree of India. In Sanskrit, Neem is described as “Aristha” which means something Complete and perfect .The different parts of neem are used as soil conditioner, pesticides, fumigants, manures etc, without harming the environment which is a major concern of recent time. If we consider organic plant protection, Farmer uses Neem as Bio-fertilizers and Bio-pesticides.

History of Neem as Plant Protector

During the 1920s research for the extraction of neem oil and neem cake started at the Indian Institute of Science in Bangalore, India. Use of Neem on a commercial level began in the 1960s. When Western countries realised that synthetics are harmful for humans as well as the environment and have the residual effect they stepped out toward the biological methods. And Neem came out to be their first choice for biological control as they know that Indian used neem for centuries to protect their crops. Three international conferences were held



regarding Neem in 1980 and 1983 in Germany and in 1986 in Kenya. Nimbin and Limonoid were isolated during 1942. Azadirachtin was isolated by D Morgan during 1970s at the UK.

Neem as an Organic Plant Protector

Every part of neem tree leaves, seeds, branches bark, etc., are beneficial for organic agriculture as they produce some compounds which have been used for centuries. To protect plants, neem is utilised in many ways in agriculture e.g. fumigant, pesticide, soil conditioner, insect growth regulator, plant growth regulator, oviposition deterrent, neem compost etc. Neem urea coating agents restrict the growth of bacteria which leads to denitrification. Conditions and nourishes the soil. Provide essential nutrients essential for normal crop growth. Neem fumigants also came into existence as human realises negative effects e.g. death of many people due to accidental intake of synthetic fumigants. Many insects till now have developed resistance to synthetics e.g. cotton bollworm is resistant to all major fertilizers present in India as well as harms beneficial insects. But neem does not cause any harm to beneficial insects and destroy harmful pests. Azadirachtin is one of the main agents used currently for pest control. Yes, neem do not show result instantly as synthetics does, but it remains in the soil for longer time and nourishes soil. It enriches the soil with essential nutrients and prevents deterioration and degradation of the soil. Generally neem cakes are used to protect the crop roots from the attack of nematodes, soil grubs and white ants etc. Neem leaves added during vermicomposting fastens growth of earthworms. Neem oil prevents the infection of pests during food storage. Neem oil ceases the further spread of pests if stored food is already infested. Neem oil is also effective against different diseases of crops that occur throughout the year such as Leaf spots, rusts, mildews, scab, blights, etc. The application of neem oil ceases the germination of the fungal spores that ultimately stops the disease development. Neem does not cause any harm to microorganisms present in the soil it nourishes them. Nitrogen is an essential element required by plants in large quantity. And anhydrous ammonia and urea are major fertilizers that provide Nitrogen to crop. Though nitrification is an important process to make available nitrogen to crop, rapid nitrification leads to more nitrogen losses. Neem plant has properties that checks nitrogen losses and slows down the process of nitrate formation and ceases denitrification. In the modern era, Neem and its products are extensively in use for plant protection around the whole world.

Components of Neem:



Azadirachtin, nimbin, limonoid, salannin, nimbidin, arginine, alanine, azadiradione, salannol, fraxinellone, etc.

Neem in Pest Management

Crop damage is a critical factor for farmers as this directly affects the income of the farmer. There are many factors that damage crops; pest and disease attack is one of the main factors. As need for preventing crop damage is realised synthetics came into existence but readily pest developed resistance against these chemicals over the year and damaging our mother earth. In this situation Organic farming comes out as saviour of agriculture and ecosystem. It is estimated that Neem and its derivatives affect 90% of pests. Neem oil, neem extracts, neem cakes and neem based biopesticides prevent pest and disease attack. It affects targeted pests without damaging the surrounding crop, rather it benefits them.

The Action of Neem on Insects:

- Neem brings out behavioral changes in insects.
- Dispersion of neem oil on the insect body causes insect suffocation.
- Neem extract disrupts egg, larval and pupal development.
- Act as an antifeedant i.e. it repels insects with the secretion of unusual odour.
- Effects of oviposition or disrupt mating and egg-laying.

Neem based pesticides

Around 80% of neem-based pesticides are used conventionally. The emphasis of many government policies is on the use of neem-based pesticides or organic pesticides for safe and healthy production. Readily genetically modified seeds or crops are also evolving which increases the use of neem. If we consider India, here consumption and use of agrochemicals are less as compared to other countries so more scope of growth of neem pesticides market exists. As cereal and other crops production are increasing, demand for neem pesticides is also increasing.

Some Neem pesticides marketers and their products:

- Indo-Neem
- Maharashtra Biofertilizers India – neem Fighter.

- Ozone Biotech– Ozoneem.
- Neem India Products –Neem Gold.
- Bighaat – Econeem plus.
- Nimbex.
- Azadin.
- PMCS Neem cake.



Advantages of Neem use in Agriculture

- Purely Organic, no residual effect.
- No harm to the environment.
- Prevent excess Nitrogen depletion.
- Production is purely organic and healthy, safe for consumption.
- Sustenance in soil fertility.
- Protects plants against harsh conditions, nutrient deficiency and pest attacks, etc.
- Harms targeted pests.

Conclusion

Neem is truly an incredible plant with lots of benefits toward agriculture and the environment. Agriculture Sector is mother or backbone of all other sectors as human is dependent on agriculture for basic needs e.g. food, shelter, fuel etc. and also a country's economy relies on agriculture. Chemicals are used for increasing total food production or crop yield which is the main reason of soil degradation. Sustainable agriculture promotes practices that are less harmful to human, environment and crop. Neem as an organic plant forms a symbiotic relationship with the plant and promotes plant growth by supplying essential nutrients. The Indian government is also promoting the use of neem coated urea. It will be easy for the normal farmer to adapt neem as raw or in derived form as Neem is use to name for the farmer. The neem products are good soil amenders and improve the organic content of the soil. In recent time Neem products are rapid in use but not as synthetics. More plantation of Neem tree is required to meet the demand of industries and for export purpose, as plant can't withstand in some countries. Awareness



regarding the cultivation of neem on different level such as villages, schools, is essential for sustenance and also it will generate employment opportunities. Neem, a booster to organic farming makes the crop tolerant to harsh climatic conditions, reduces post harvest losses and improves crop production.

