

## Neem as organic plant protectant in agriculture

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### Introduction

Neem (*Azadirachta indica*) is commonly called 'Indian Lilac' and belongs to the family meliaceae. It possesses maximum useful non-wood products (leaves, bark, flowers, fruits, seed, gum, oil and neem cake) than any other tree species. These non-wood products are known to have anti-allergenic, anti-dermatic, anti-feedent, anti-fungal, anti-inflammatory, anti-pyorrhoeic, anti-scabic, cardiac, diuretic, insecticidal, larvicidal, nematocidal, spermicidal and other biological activities. Because of these activities, neem has found enormous applications making it a green treasure. A major challenge of agriculture is to increase food production to meet the needs of the growing world population, without damaging the environment. In current agricultural practices, the control of pests is often accomplished by means of the excessive use of agrochemicals, which can result in environmental pollution and the development of resistant pests. In this context, biopesticides can offer a better alternative to synthetic pesticides, enabling safer control of pest populations.

It is because of its tremendous therapeutic, domestic, agricultural and ethnic medical significance, and its proximity with human culture and civilization, that it has been called "the wonder tree" and "nature's drug store".

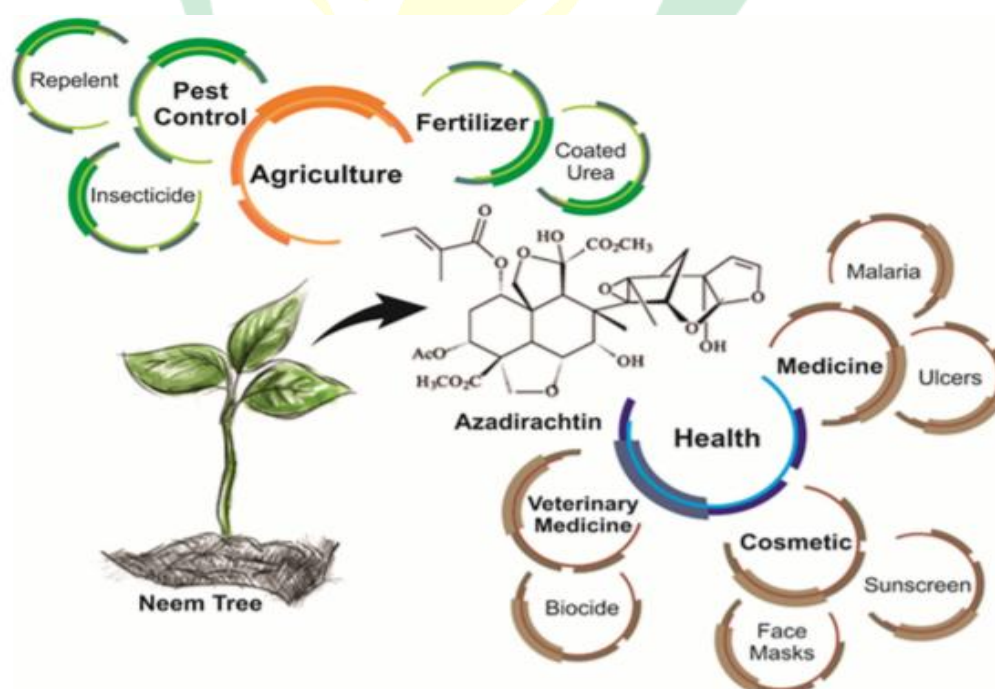
### Neem as fumigant

Neem tree has been used against household, storage pests and crop pests. Neem pest fumigant is available in the gaseous state and is used as a pesticide and disinfectant. It is being used by a large number of countries on a commercial basis by farmers and agriculturists. This 100% natural product is being exported as it is non-toxic and does not affect the environment. It assumes more importance in developing countries where millions of deaths are reported every year due to the accidental intake of synthetic pest fumigants. This natural fumigant not only kills pests but also affects them negatively by acting as feeding and oviposition deterrence, mating disruption, inhibition of growth, etc. According to

studies undertaken, neem fumigant helps to protect stored rice grains from pests. One of the major benefits of this organic fumigant is that pests do not develop resistance to it (Grace, 1991). With the increasing trend of using biofertilizers, insecticides and pesticides, neem is being increasingly cultivated and grown all over the world to get active ingredient-azadirachtin, responsible for stopping the growth cycle of insects and pests, fungi, etc. Neem is also assuming a lot of importance in crop management. Considering the fact that neem is not only a cheaper, naturally occurring product and an effective method to control pests and insects, but also has no side effects on plants or other living beings, it is not a wonder that research is being carried to try neem and its products for large scale production of natural pesticides and insecticides. This is a good opportunity for manufacturers and exporters to produce quality bio agricultural products. Neem oil and seed extracts are known to possess germicidal and anti-bacterial properties which are useful to protect the plants from different kinds of pests. This natural product does not leave any residue on plants.

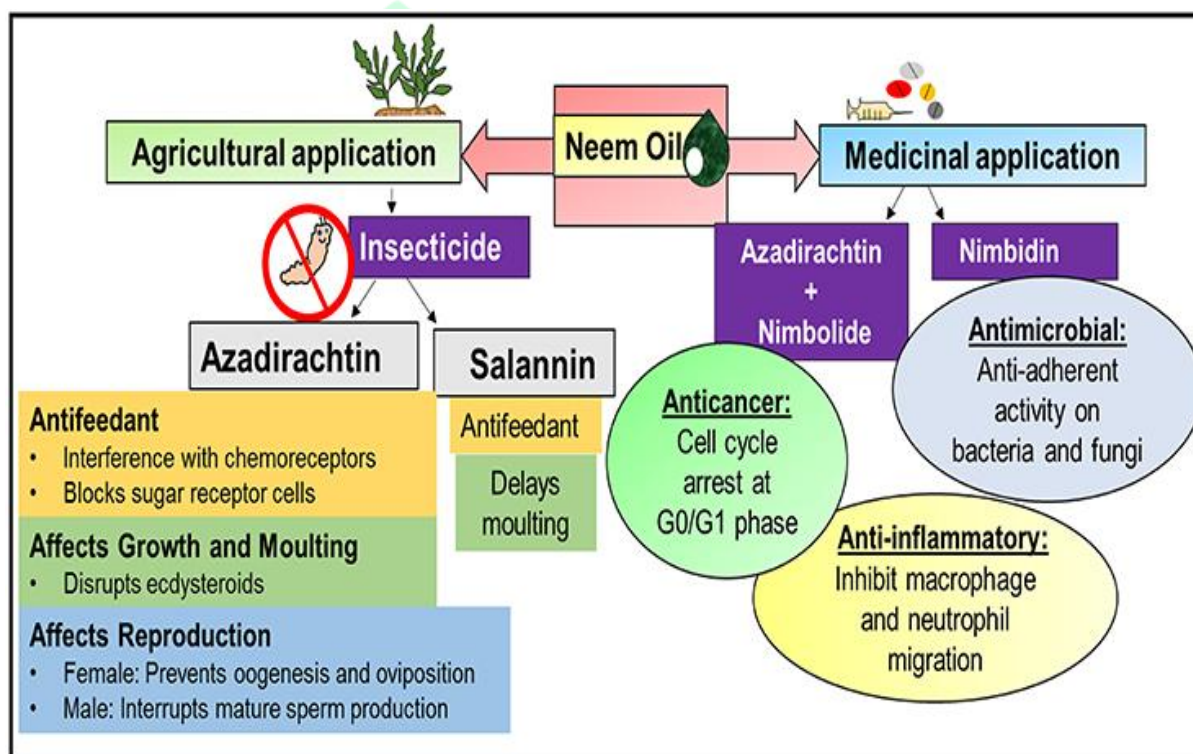
### Benefits

Neem fumigants are eco-friendly, do not harm other microorganisms, non-toxic, and do not contaminate terrestrial and aquatic environments. Pests do not develop resistance to it, there are no negative effects, relatively less expensive, pest repellent and nourish the soil and function as pest reproduction controller.



## Repellents

The extracts prepared from neem plants have a variety of properties including repellence to pests (Prakash and Rao, 1997). According to Shannaget *et al.*, (2014), the repellent action of Azatrol, Triple Action Neem Oil and Pure Neem Oil are wholly dependent on the concentration that is used. He showed that the three products at higher concentrations were able to repel aphids feeding on sweet pepper plants. Abubakar *et al.*, (2000) also reported repellent and antifeedant properties of *Cyperus articulates* against *T. castaneum*.



## Neem as pesticide

Neem oil is recognized as a powerful biopesticide and may offer a solution to global agricultural, environmental, and public health problems. The neem seed oil allelochemicals are reported to have feeding and oviposition deterrence, repellency, growth disruption, reduced fitness, and sterility activities, and hence have been widely used in agricultural pest control (Brahmachari, 2004). In neem seed oil, high concentrations of bioinsecticide limonoids are reported mainly azadirachtin A, azadirachtin B, Nimbin, and salannin (Stark and Walter, 1995). The most potent limonoid in neem seed oil, azadirachtin, primarily acts as an insect repellent and insect growth regulator (IGR).

### Conclusion

The need for a steady and safe food supply to the world's rising population has led to the exploration of the neem tree as a bio-pesticide. With the growing knowledge on the use of bio-pesticides, it will gradually replace the conventional chemical pesticides presently in use. As neem act as the most reliable source of pro-pesticide having no adverse effect on humans and animals. Thus, neem-based products play a crucial role in organic agriculture.

### References

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