

Neem and Its Beneficial Uses

Neem was “discovered” in the western world in 1959 when a German entomologist noticed that it was the only green standing after a swarm of locusts swept through the Sudan.

Neem protects itself from the multitude of pests with a multitude of pesticidal ingredients. Its main chemical broadside is a mixture of 3 or 4 related compounds, and it backs these up with 20 or so others that are minor but nonetheless active in one way or another. In the main, these compounds belong to a general class of natural products called "triterpenes"; more specifically, "limonoids." (Nat Academy Press)

Neem is a type of mahogany, a fast-growing evergreen tropical to subtropical tree that can reach a height of 50-65 feet. It is noted for its drought resistance - it thrives in areas with sub-arid to sub-humid conditions. It can grow in regions with an annual rainfall below 15 inches, but it then must have help from present ground water levels. In severe drought it may shed most or nearly all of its leaves. It is being commercially grown in Florida.

Important Note: We find that a healthy garden does not need major controls, but bad things can happen to a garden. Neem oil is very effective and is least disruptive to your garden's ecology. At Bountiful Gardens we sell 100% neem oil. Most neem products have only 1% neem as the active agent, and at this dilution neem works very, very well! So please, please dilute our 100% neem oil to only 1-2% for an effective control.

Neem oil affects insects in many different, ingenious and subtle ways; Neem derivatives neutralize nearly 500 pests worldwide, including insects, mites, ticks, and nematodes, by affecting their behavior and physiology.

You have to realize that neem is not a poison and does not work immediately to kill on contact. What you get with neem is the most powerful, long-lasting control available, precisely because it works in other ways. This is precisely why we offer neem, because it is an organic control.

First of all, Neem simply stops many insects from eating the plants or repels them. This occurs two different ways:

First, neem oil has a hormone-like activity that causes leaf eating insects to "forget" to eat, breed, or undergo metamorphosis after they've ingested, or even just been in contact with, traces of neem. The subtlety of these hormonal effects, and that they may take days or weeks to manifest, makes people overlook them. This allows neem to “kill” bad insects. Insects that feed on nectar or other insects, such as butterflies, bees, and ladybugs, do not accumulate significant concentrations of neem products.

Second, there is something in the presence and smell of neem that is enough to repel leaf eating insects (such as grasshoppers and leafhoppers) and keep them from eating a protected plant. Formulations made of Neem oil find wide usage as a bio-pesticide for organic farming, as it repels a wide variety of pests including the mealy bug, beet armyworm, aphids, the cabbage worm, thrips, whiteflies, mites, fungus gnats, beetles, moth larvae, mushroom flies, leafminers, caterpillars, locust, nematodes and the Japanese beetle. Grasshoppers have been observed to starve to death rather than eat neem as the only food source.

Neem is an organic pest control

Let's take neem oil as an example (since that is what we sell), but the whole tree has insecticidal properties. First of all neem will break down fairly quickly in the environment like many insecticides (it is especially susceptible to UV light), but it breaks down into benign natural compounds. Most commercial insecticides break down into questionable (or downright dangerous) compounds that frequently build up over time. Neem does not do this.

Neem oil works from inside the plant. Plants readily absorb neem oil – they take it up into their tissue and neem works from inside the plant (Neem infused plants are not toxic – in fact they are very healthy. There are an incredible number of medical benefits from ingesting neem). Neem ingredients accumulate in the more internal tissues of the plant. The phloem, the outermost layer, contains hardly any. This means that a surface eater like an aphid will not be affected by the internalized neem, but a grass hopper will be incapacitated after a few bites.

Neem oil will suffocate insects, but why bother?

Many gardeners use mineral oil or a vegetable oil to combat soft bodied insects like aphids, thrips or whitefly. The oil coats the bugs and suffocates them. Neem oil can do this as well, but it is not the most efficient use of neem, nor the best for your garden's health. Oil used this way will suffocate beneficial insects as well.

Mixing neem oil with a wetting agent/ surfactant helps keep the neem oil on the surface of the plant for protection from surface feeders, while also optimizing its absorption into the plant where it can provide long-term protection from major leaf eaters.

Neem Oil co-exists well with beneficial insects.

Neem is non toxic for beneficial insects, mostly because beneficial insects don't eat your plants. Beneficial insects are most active during the day, so spray neem oil very early in the morning or in the late afternoon or evening. That way the spray can dry before the good insects become active. Once the spray has dried it does not harm your butterflies, bees, ladybugs, lacewings, predatory mites and wasps etc. Neem Oil is not known to be harmful to mammals, birds, or earthworms. But be aware that you can smother and kill beneficial insects with neem oil, so please be careful.

Other Aspects of Neem pest and disease control

Neem can be used as a household pesticide for ant, bedbug, cockroach, housefly, sand fly, snail, termite and mosquitoes both as repellent and larvicide. Neem oil also controls black spot, powdery mildew, anthracnose and rust (fungus).

Neem is reportedly very effective in the treatment of scabies, although only preliminary scientific proof at present exists. Also, the scabies mite has yet to become resistant to neem, so in persistent cases neem has been shown to be very effective. There is also anecdotal evidence of its effectiveness in treating infestations of head lice in humans. A tea made of boiled neem leaves has been said to fight intestinal worms. The oil is also used in sprays against fleas for cats and dogs.

Neem could be applied to protect stored seeds against insects.

Neem is beneficial to humans and animal life

The National Academies Press (the publishing arm of the US Academy of Science) published a book in 1992 titled, *Neem: A Tree for Solving Global Problems*. Its description says, "The neem tree, one of the most promising of all plants, may eventually benefit every person on the planet. Probably no other plant yields as many varied products or has as many exploitable by-products. Indeed, as foreseen by some scientists, this tree may... provide millions with inexpensive medicines"

Neem (*Azadirachta indica*) is known as the "village pharmacy." In India, the tree is variously known as "Divine Tree," "Heal All," "Nature's Drugstore," "Village Pharmacy" and "Panacea for all diseases" in its native India where it has been used for nearly 5000 years as a cornerstone of the Ayurvedic tradition. In East Africa it is also known as Muarubaini (Swahili), which means the tree of the 40, as it is said to treat 40 different diseases.

Neem oil has an extensive history of human use in India and surrounding regions for a variety of therapeutic purposes. It is considered a major component in Ayurvedic medicine and is particularly prescribed for skin disease. The most frequently reported indications in ancient Ayurvedic writings are skin diseases, inflammations and fevers, and more recently rheumatic disorders, insect repellent and insecticide effects. Traditional Ayurvedic uses of neem include the treatment of Acne, fever, leprosy, malaria, ophthalmia and tuberculosis.

Various folk remedies for neem include use as an anthelmintic, antifeedant, antiseptic, diuretic, emmenagogue, contraceptive, febrifuge, parasiticide, pediculocide and insecticide. It has been used in traditional medicine for the treatment of tetanus, urticaria, eczema, scrofula and erysipelas.

All parts of the tree (seeds, leaves, flowers and bark) are used for preparing medical preparations. Products made from neem have proven medicinal properties, being anthelmintic, antifungal, antidiabetic, antibacterial, antiviral, anti-fertility, and sedative.

Neem oil is used for preparing cosmetics (soap, shampoo, balms and creams, for example Margo soap), and is useful for skin care such as acne treatment, and preserving skin elasticity. Neem oil contains high levels of antioxidants combined with long-chain fatty acids and natural glycerides to help soothe even chronically dry, itchy skin or scalp.

Neem oil has been found to be an effective mosquito repellent. Neem derivatives neutralize nearly 500 pests worldwide, including insects, mites, ticks, and nematodes, by affecting their behavior and physiology. Neem does not normally kill pests right away; rather it repels them and affects their growth. As neem products are cheap and non-toxic to higher animals and most beneficial insects, it is well-suited for pest control in rural areas.

Aqueous extracts of neem leaves have demonstrated significant antidiabetic potential. Traditionally, teeth cleaning was conducted by the chewing of slender neem branches. Neem twigs are still collected and sold in markets for this use, and in India one often sees youngsters in the streets chewing on neem twigs. A decoction prepared from neem roots is ingested to relieve fever in traditional Indian medicine. Neem leaf paste is applied to the skin to treat acne.

The tender shoots and flowers of the neem tree are eaten as a vegetable in India. Neem flowers are very popular for their use in Ugadi Pachhadi (soup-like pickle). The (white and fragrant) flowers are used to make a curry called ugadi pachadi.

Some results of Modern Neem Research

There has been a lot of research into neem compounds as anti-carcinogenic¹⁻³. Research using mice indicates that neem oil acts as a non-specific immunostimulant and that it selectively activates the cell-mediated immune (CMI) mechanisms to elicit an enhanced response to subsequent mitogenic or antigenic challenge.⁴

Laboratory tests against fourteen strains of pathogenic bacteria found neem oil greatly reduced them.⁵ Research with mice gave some scientific support to the use of neem against cholera and diarrhea.⁶ Fractionated neem leaf extract increased CD4+ cell levels in HIV/AIDS patients without observed adverse effects.⁷ Neem mouthwash reduced cavities⁸ and Neem chewing sticks have been shown to be anti-plaque, anticariogenic, and antibacterial⁹. Research has shown that extracts from leaf, flower and stem bark of the Siamese neem tree have strong antioxidant potential.¹⁰ Neem bark extract has therapeutic potential for the control of gastric hyperacidity and ulcer¹¹. Finally Neem leaf and its constituents have been demonstrated to exhibit immunomodulatory, anti-inflammatory, antihyperglycaemic, antiulcer, antimalarial, antifungal, antibacterial, antiviral, antioxidant, antimutagenic and anticarcinogenic properties.¹²

Neem seed extract shampoo has been shown to be very effective against mites in dogs¹³ and lice¹⁴ in humans with little side effects. “The neem seed extract shampoo proved to be highly effective against all stages of head lice. No obvious differences regarding the efficacy of the shampoo were observed between an exposure time of 10, 15 or 30 min. No side effects, such as skin irritation, burning sensations, or red spots on the scalp, forehead or neck, respectively, were observed¹⁴.”

References:

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