

Neem

A more environmentally responsible pesticide

This article is intended to provide answers about what neem is, when and where to use it (or not), how to use it, and why you cannot use it in Canada.

A little history about neem trees

A neem tree (*Azadirachta indica*) is a fast-growing large evergreen tree, generally 15-20m tall, occasionally growing to 35-40m. It is a tree that does very well in sandy soil and is drought resistant, yet it will shed its leaves in severe drought conditions. Vast quantities have been planted to stop the growth of deserts, reclaim degraded land, increase soil fertility, and for firewood. Although the focus here is on neem from an ornamental garden perspective, it is interesting to know that neem trees have been used and are still used for traditional medicinal purposes. In Tanzania and other Indian Ocean states, it is known as 'the tree that cures forty diseases'.

Native range: India, Pakistan, Malaysia, Sri Lanka, Thailand, and South-East Asia, although this has not been confirmed.

Naturalized distribution: Neem trees have been exported to many different countries worldwide (Australia, Asia, Central/South America, Africa, Puerto Rico, the Caribbean).

Invasive potential: Neem trees have shown to be invasive. It can (and will) invade grasslands, shrubby areas, riverbanks and floodplains, and areas near a coastline. Although it is planted for many reasons, excellent management strategies are necessary to mitigate its invasive potential.



About Neem as a pesticide



For centuries in India, the leaves, twigs, and juice have been used to keep away insects. Neem is a biodegradable, broad spectrum non-toxic systemic pesticide. It is yellow to brown in colour and has an aroma akin to garlic or sulphur. Extracts from the leaves and seeds (which resemble an olive-type drupe) are processed into a variety of formulations (granules, cakes, dust, wettable powders or emulsifiable concentrates). Neem is rapidly broken down by microbes and light in most soil and water environments. The United States National Pesticide Information Centre has a General Fact Sheet which details the chemical breakdown. Neem is sensitive to high temperatures and should be kept out of the light. Unmixed, the concentrate will remain effective for up to 2 years if stored properly, with little to no loss of potency. To date, neem is effective on 200+ insects and is known to limit the spread of fungi. Remember, it is always a good idea to test a small patch of your plant first.

How it works

Insects will ingest what has been absorbed and circulated throughout the plant tissue. The most active component in neem is Azadirachtin, which acts as both an antifeedant and a growth regulator. These properties

cause insects to reduce or cease feeding, prevent metamorphosis (and therefore the laying of eggs), and reduces/interrupts mating. It can take 2 or 3 weeks to fully affect the metamorphosis of insects and prevent the next generation.

Multiple Formulations

Neem can be used as a foliar spray, soil drench, and as granules. There is also an injectable product called TreeAzin that I will address within the “Using Neem in Canada” section.

Foliar sprays are handy, easy to use and the most common choice for home gardeners. They come in a ready-to-use spray, or a concentrate liquid that is mixed with water and then sprayed. Once on plants neem will remain effective for 2-3 weeks.

A soil drench allows neem to be absorbed by the roots and transported throughout the entire plant. This protects plants inside and out.

Granules can be sprinkled around the base of a plant and are a by-product from the pressing of the fruit for oil.

What to use Neem for

As a responsible gardener, one should first assess if a pesticide is truly required. For example, some beneficial insects (ladybugs) will come and feast on your problematic insects (aphids). Indeed, some may be very unsightly, but it doesn't mean they are a real problem for the plant (sometimes it's just a problem for the gardener!). Give your beneficial insects an opportunity to solve the problem for you, before choosing to spray.

Arthropod infestations: Arthropods (segmented hard-shelled insects) are the most common infestations for home gardeners. Neem is highly effective in dealing with aphids, whiteflies, tomato hornworm, lily and Japanese beetles, gypsy moths, locusts, mealybugs, weevils, carrot flies, gall, nematodes, grass grubs etc. Arachnids, insects, millipedes, centipedes, and crustaceans are also part of the arthropods, so neem will affect them also.

Fungal infections: Neem prevents spore production. It does not get rid of what you already have, but it prevents the problem from getting worse. Can be used for both Powdery and Downy Mildew.

When it's best to apply

Any application should be done in the early evening, nighttime, or early morning. These are times when bees are less active in the garden, so there is much less risk to their health. When neem is applied during the heat and sun of the day, it has the potential to burn the foliage, another good reason to apply late in the day. Neem should not be used on any plants stressed from drought, over watering or transplanting.

How to apply

Foliage should be completely coated, but not saturated. If using a concentrate, make sure you carefully follow ALL directions on the label.

What if you get Neem on beneficial insects?

Neem is a proven toxin to a Queen bee's reproductive abilities and their larvae when brought back to the hive. It is also toxic to hoverfly larvae. If you spray beneficial insects, it is likely they will die. Remember that it is a systemic pesticide, and it will harm the good as well as the bad, so it needs to be used judiciously.

If you get it on your skin

Irritation to the skin ranges from not at all to very irritating, depending on the person. It can be washed off.

Using neem in Canada



The sole Neem product legally available for use in Canada at this point is TreeAzin (PCP #30559). This product is injected into the base of trees and MUST be applied by a licensed professional. It was developed in conjunction with BioForest and the Canadian Forest Service (CFS). Health Canada's Pest Management Regulatory Agency (PMRA) has registered it for insects that eat tree tissue. Some of the insects it is used against include: Emerald Ash Borer, Gypsy Moth, Tent Caterpillars, Spruce Budworm, Jack Pine Budworm, Arborvitae Leafminers, Sawflies (including Birch Leafminer and Introduced Pine Sawfly), European Elm Scale, and Red Elm Bark Weevil. Ontario's Ministry of Environment, Conservation and Parks (MOECP) scheduled TreeAzin as a Class C Pesticide. Research trials are underway to see if there are other pests it would be effective against.

The legality of using neem in Canada

It has not been registered in Canada as a pesticide. In 2012 a ban was placed on the import and export of neem and its related products. The mix of active ingredients is one of the reasons it is so difficult to get approval for use in Canada. There are many things that can affect the test samples (what country the tree is grown in, how it is shipped, etc.). To date in testing, the standard of potency and the level of efficacy has not been consistent. Canada requires all components of a fertilizer or insecticide to be screened, which is a lengthy and expensive process. Even though neem has shown indications that it is safe when used properly, there have been few tests and studies to prove it is non-toxic to mammals (humans and dogs etc.), so the possibility of any future issues has not been fully explored. The Pest Management Regulatory Agency (PMRA) of Health Canada is responsible for the regulation of pesticides in Canada. The PMRA website can be viewed at <http://www.pmr-arla.gc.ca/english/index-e.html>. In the United States, neem has been approved only for ornamental garden use.

Neem has the potential to be an alternative option to currently available synthetic pesticides. However, Canada is just not at that point yet. For now, it is illegal for home gardeners in Canada to purchase neem to use as a pesticide in their gardens. Hopefully in the future better biodegradable and environmentally responsible options will be developed, making synthetic pesticides a thing of the past. Perhaps neem will become one of them.

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