

What is neem oil?

Neem oil is a naturally occurring [pesticide](#) found in seeds from the neem tree. It is yellow to brown, has a bitter taste, and a garlic/sulfur smell. It has been used for hundreds of years to control pests and diseases. Components of neem oil can be found in many products today. These include toothpaste, cosmetics, soaps, and pet shampoos. Neem oil is a mixture of components. Azadirachtin is the most active component for repelling and killing pests and can be extracted from neem oil. The portion left over is called clarified hydrophobic neem oil.



What are some products that contain neem oil?

Neem oil and some of its purified components are used in over 100 pesticide products. They are applied to a wide variety of crops and ornamental plants for insect control. Neem oil can be [formulated](#) into granules, dust, wettable powders or emulsifiable concentrates.

Always [follow label instructions](#) and take steps to avoid exposure. If any exposures occur, be sure to follow the First Aid instructions on the product label carefully. For additional treatment advice, contact the Poison Control Center at 1-800-222-1222. If you wish to discuss a pesticide problem, please call 1-800-858-7378.

How does neem oil work?

Neem oil is made of many components. Azadirachtin is the most active. It reduces insect feeding and acts as a [repellent](#). It also interferes with insect hormone systems, making it harder for insects to grow and lay eggs. Azadirachtin can also repel and reduce the feeding of nematodes. Other components of neem oil kill insects by hindering their ability to feed. However, the exact role of every component is not known.



How might I be exposed to neem oil?

People can be exposed to chemicals by eating them, breathing them in, through skin contact and eye contact. Since neem oil is used on a variety of crops, people are mainly exposed to neem oil in their diet. People who apply neem oil may also be exposed if they inhale the mist or dust, let the product touch their skin, or fail to wash their hands before eating or smoking. However, the label includes directions for [keeping exposure low](#). For example the label might require applicators to wear protective clothing.

What are some signs and symptoms from a brief exposure to neem oil?

Neem oil can be slightly irritating to the eyes and skin. Azadirachtin, a component of neem oil, can be very irritating to the skin and stomach. The remaining portion of neem oil is made of fatty acids, essential oils and other substances that are commonly eaten in a normal diet. These substances are generally recognized as safe (GRAS) by the United States Food and Drug Administration.

In other countries, neem oil has been used on cats for flea control. Some adverse reactions have been reported. Symptoms include feeling sluggish, excessive salivation, impaired movement, trembling, twitching, and convulsions. Some of the cats died. However, most of them recovered within 1 to 5 days.



What happens to neem oil when it enters the body?

Clarified hydrophobic neem oil (without azadirachtin) is made of fatty acids and glycerides. These substances are commonly found in food. When they enter the body, they are broken down, used for energy, and incorporated into cells.

In one study, scientists injected insects with azadirachtin. They found 90% of the dose in the insects' feces within 7 hours. The remaining portion lingered in the insects' bodies for 24 days after the injection.

Is neem oil likely to contribute to the development of cancer?

No. People have been exposed to neem oil in many ways for hundreds of years. During this time no association with increased [cancer](#) risk has been found. Studies showed that neem oil did not alter or damage genes. In laboratory tests, animals were fed neem oil for 90 days. They did not have increased cancer rates.

Further, one study found that certain components of neem oil caused cancer cells in hamsters to stop growing or die. Another study looked at prostate cancer cells from humans. Researchers found that neem leaf extract was able to slow their growth.

Has anyone studied non-cancer effects from long-term exposure to neem oil?

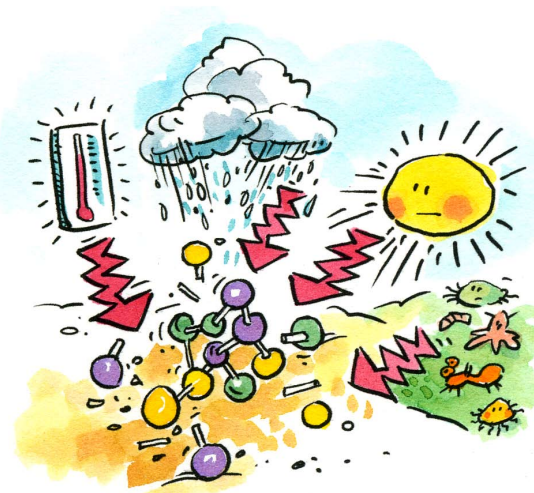
In rat studies, no effects were reported when the rats were fed either azadirachtin or clarified hydrophobic neem oil throughout their lives.

Are children more sensitive to neem oil than adults?

In general, [children may be especially sensitive to pesticides](#) compared to adults. When rats were fed neem oil in one study, their pregnancies ended. In another study, rats were fed azadirachtin in their diet throughout their lives. No effects to their offspring were found. Additionally, neem oil is used in toothpaste, cosmetics, soaps and traditional medicines around the world. Therefore, people of all ages are commonly exposed to neem oil. No data were found to show that children are more sensitive than adults to neem oil.

What happens to neem oil in the environment?

Azadirachtin, a major component of neem oil, is rapidly broken down. Microbes and light break down the pesticide in soil, water and on plants. The [half-life](#) of azadirachtin in soil ranges from 3 - 44 days. In water, the half-life ranges from 48 minutes to 4 days. It also rapidly breaks down on plant leaves; the half-life is 1 - 2.5 days. The remaining components of neem oil are broken down by microbes in most soil and water environments.



Can neem oil affect birds, fish, or other wildlife?

Neem oil is practically non-toxic to [birds, mammals](#), bees and [plants](#). Neem oil is slightly toxic to fish and other aquatic organisms. Azadirachtin, a component of neem oil, is moderately toxic to fish and other aquatic animals. It is important to remember that insects must eat the treated plant to be killed. Therefore, bees and other pollinators are not likely to be harmed.

Where can I get more information?

For more detailed information about neem oil please visit the list of [referenced resources](#) or call the National Pesticide Information Center, between 8:00 AM and 12:00 PM Pacific Time (11:00 AM to 3:00 PM Eastern Time), Monday - Friday, at 1-800-858-7378 or visit us on the web at <http://npic.orst.edu>. NPIC provides objective, science-based answers to questions about pesticides.

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