

# Bioefficacy of Aqueous Neem Leaf (*Azadirachta indica*) Extract against Whitefly (*Bemisia tabaci*) on Cotton

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## ABSTRACT

Whiteflies are the most severe pests of cotton. Chemical insecticides used to control whiteflies threaten wildlife and the environment. Whiteflies can be eradicated using neem leaf extract. To combat the whitefly, we tried neem leaf extract. Whitefly reduction using neem leaf extract. Eliminate 80% of whiteflies with neem leaf extract. Neem leaf extract reduces whitefly eggs on cotton plants. Neem leaf extract provides effective and sustainable whitefly control. It is a better and safer alternative to using chemical pesticides.

### Introduction

The leaf extract of water-soluble neem (*Azadirachta indica*) can eradicate whitefly (*Bemisia tabaci*). Indian researchers treated whiteflies on cotton plants with 2% neem leaf extract. Significant reduction (80%) of neem leaf extract and whitefly. Neem leaf extracts concentrate whitefly eggs on cotton plants. Neem leaf extract could inhibit whitefly development. This part contains the natural insecticide azadirachtin, which acts on the nervous system of insects. Azadirachtin also makes it difficult for whiteflies to reproduce. An environmentally friendly and sustainable practice is to use neem leaf extract to eradicate cotton whitefly. Neem leaf extract is safe for pollinators and other beneficial insects. It breaks down in the environment without causing any harm to the cotton plant.

### Using neem leaf extract benefits

Due to its effectiveness, whitefly populations can be reduced by up to 80%. It is a safe and effective natural insecticide that does not pose a threat to people, pets, or even good bugs. It breaks down naturally and will not harm the cotton plant. This whitefly control method is safe for the environment and can be used for a long time. The neem leaf extract is an excellent eco-friendly alternative to chemical whitefly control on cotton. The system is reliable, safe and durable.

### Control whitefly through neem leaf extract

To make neem leaf extract, mix freshly ground neem leaves with water. The recommended dose of neem leaf extract is 5%. Spray cotton plants with neem leaf extract. Regular use of neem leaf extracts every 7-10 days will keep whiteflies at bay. Protecting your hands and eyes when using neem leaf extract is essential.

### Extract of neem leaf

Neem is a source of natural pesticides found in the leaves. Although the neem tree originally came from India, it can now be found in gardens worldwide. Azadirachtin, found in neem leaf extract, is an insecticide. Insects can be killed with azadirachtin because it affects their central nervous system. It also can potentially hinder the reproductive process of insects (1).

### Importance of Whitefly

Whiteflies are small, sap-sucking insects that cause severe damage to many crops, including cotton. Whiteflies feed on plant sap, which can seriously damage vegetation. This can cause your plants to turn a pale yellow and eventually die. Whiteflies can also spread diseases between plants. Figure 1 shows the life cycle of a whitefly.

### Control of whitefly

The whitefly is a damaging pest that can severely reduce crop yields. It is crucial to protect crops from whiteflies and avoid yield loss. Whiteflies can be controlled in several ways. Eliminating weeds and other whitefly host plants are integral to cultural control. Whitefly adults and larvae can be removed with the help of insecticidal soap. Whiteflies can be controlled with the help of a natural insecticide called neem oil. Plant chemicals taken up by plants and used to combat insects such as whiteflies are considered "systemic." When deciding on a control method, it is essential to consider the context. While cultural controls can help reduce whitefly populations, they may not be enough to eradicate the pest completely. Insecticides may sometimes be required. Follow label directions and use pesticides sparingly to protect beneficial insects and pollinators (2).

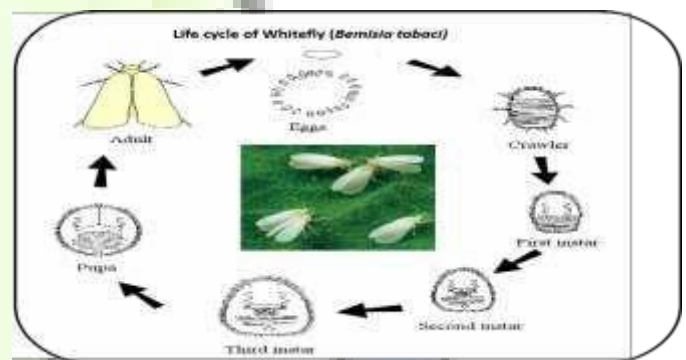
### Neem leaf extract efficacy against whitefly

#### Indian Study

In India, researchers investigated whether neem leaf extract could reduce whitefly infestation. Cotton plants infected with whiteflies were used in the experiments. Spray the plants with neem leaf extract at a concentration of 2%. Significant reductions in whitefly populations were found after applying the neem leaf extract. The whitefly mortality rate is around 80%. Cotton plants have fewer whitefly eggs due to the neem leaf extract.

#### Study results

The results of this study support the use of neem leaf extract as a natural insecticide for whitefly control. Several crops can benefit from using neem leaf extract to reduce whitefly populations. Neem leaf extract can be used instead of harmful chemical pesticides. The duration of the study was two weeks. Fresh neem leaves are ground and mixed with water to extract the neem leaves. Spray cotton plants with neem leaf extract. Inspect cotton plants daily for signs of whiteflies. Count the adult and larval whiteflies. Statistical tests were performed on the research data. The results of this study support the use of neem leaf extract as a natural insecticide for whitefly control. Several crops can benefit from using neem leaf extract to reduce whitefly populations. Neem leaf extract can be used instead of harmful chemical pesticides (3).



**Figure 1: Life cycle of whitefly (*Bemisia tabaci*)**

### Works neem leaf extract against whitefly

#### Constituent of neem (*Azadirachtin*)

Azadirachtin, found in neem leaf extract, is an insecticide. Insects can be killed with azadirachtin because it affects their central nervous system. It also has the potential to hinder the reproductive process of insects.

#### Neem leaf extract interference with the reproduction of Whitefly

Neem leaf extract also makes it difficult for the whitefly to reproduce. The extract stops the development of whitefly larvae. It is also effective against whitefly larvae. When azadirachtin binds to its receptor, the whitefly's nervous system is the target. The whitefly's ability to coordinate muscles and nerves is affected. Whiteflies are immediately paralyzed and eventually die. Azadirachtin interferes with the reproductive process of whiteflies. The extract stops the development of whitefly larvae. It is also effective against whitefly larvae. Due to its anti-parasitic and anti-feeding properties, neem leaf extract can effectively control whiteflies. Several crops can benefit from using neem leaf extract to reduce whitefly populations. Neem leaf extract can be used instead of harmful chemical pesticides.

#### Benefits to controlling whitefly through neem leaf extract

Several studies have shown that neem leaf extract protects against whiteflies. In a neem leaf extract study, whitefly populations were reduced by up to 80%. Neem is a source of natural extracts made from the leaves. This insecticide contains no synthetic chemicals or toxic ingredients. Neem leaf extract is non-toxic to plants and the environment and breaks down quickly. Neem leaf extract is a sustainable and effective alternative to chemical pesticides. Manage whitefly populations without endangering valuable insects such as pollinators. The active ingredients in neem leaves are non-toxic. It is non-toxic and has no harmful effects when inhaled or applied topically. Neem leaf extract is easy to make and use on plants. It can be sprayed on vegetation with a sprayer or garden hose. Whiteflies can be controlled inexpensively using neem leaf extract. It does not require repeated applications like synthetic insecticides and is more economical (4).

**Instructions for controlling Whitefly using neem leaf extract**

They got some new neem leaves. Make a paste with neem leaves. Mix water into the neem leaf paste. Strain the neem leaf mixture to remove any solids. Now, you can use neem leaf extract. Using a sprayer, spray neem leaf extract on the plants. Be sure to apply neem leaf extract to all parts of the plant, including the undersides of the leaves. Use neem leaf parts every 7 to 10 days until the whitefly population is under control. Regular use of neem leaf extract is a must for whitefly control. Neem leaf extract is not a contact insecticide, so it is ineffective against whitefly. Neem leaf extract disrupts the life cycle of the whitefly. Multiple applications of neem leaf extract may be required to eradicate a whitefly infestation completely. Wear gloves and protective eyewear when handling neem leaf extract. Avoid applying neem leaf extract to plants in direct sunlight. Do not apply neem leaf extract to flowering plants. Neem leaf extract is toxic to aquatic life and should not be used on plants near water.

**Cautionary measures for neem leaf extract use**

Never consume neem leaf extract. Avoid getting neem leaf extract in your eyes or on your skin. If neem leaf extract comes into contact with the skin or eyes, remove it immediately with soap and water. If you experience any adverse side effects after using neem leaf extract, discontinue use and consult your doctor. Neem leaf extract is an effective and safe method of controlling whiteflies. It is essential to follow the guidelines above to ensure the safe and effective use of neem leaf extract (5).

**Conclusion**

Neem leaf extract controls whitefly in a natural, effective and sustainable way. The tree produces neem leaf extract, a natural insecticide. It contains azadirachtin, an insecticide. Azadirachtin kills insects by interfering with their nerves. It makes it difficult for insects to reproduce. Several studies have shown that neem leaf extract can kill whiteflies. In the survey, neem leaf extract reduced whiteflies by 80%. The leaf extract of the neem tree is natural. Contains no harmful chemicals or synthetic pesticides. Neem leaf extract is biodegradable and does not harm the environment or plants. Sustainable are natural insecticides such as neem leaf extract. It kills whiteflies without affecting pollinators. Neem leaf extract effectively and naturally controls whitefly. Protect plants effectively and economically. Fresh neem leaves are ground with water to make an extract. The extract of neem leaves should be 5%. Plants sprayed with neem leaf extract. Use neem leaf extract on all parts of the plant, including the undersides of the leaves. Every 7 to 10 days, use neem leaf extract to control whiteflies. Protect your hands and eyes when handling neem leaf extract.

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