NEEM OIL: CHENO vs. COLD PRESSED

WHY PROCESS MATTERS FOR PLANT HEALTH & EFFICACY

What is Neem Oil?

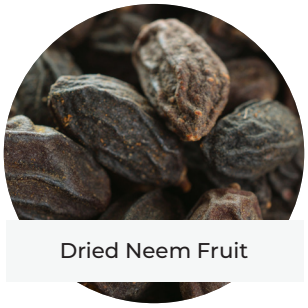
Neem is a naturally occurring organic pesticide found in the seeds of the neem tree that acts as an insect repellant and reduces feeding. Neem is a multi-functional product for the home garden or greenhouse and controls many insects and diseases.

- While neem oil has multiple uses, the process of selection and extraction is the differentiating factor in its effectiveness and safety for crop health in agriculture.
- Cold pressed neem oil is effective, but it is lower quality than CHENO and can lead to phytotoxicity and azadirachtin residue on plant surfaces.

Processes from Seed to Neem Oil



Neem Tree with Fruit



Dried Neem Fruit



Neem Seeds



Dried Kernels

Dried kernels are then ground and further processed via:

PRESS

Crude/ "Cold pressed" neem oils contain 0.1-0.3% azadirachtin for use as an insecticide, fungicide, plant shine or herbal supplement.

EXTRACTION

Top grade neem is separated into azadirachtin technical powder with 10-20% azadirachtin and solvent extracted neem oil (CHENO) with >0.1% azadirachtin.

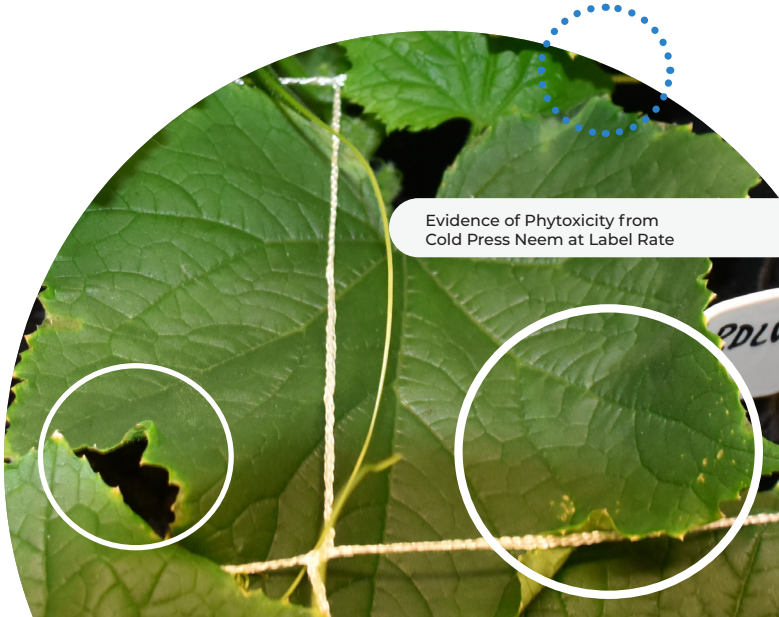
HEAT

Steam and pressure are then used to create a stable and purified neem oil.

Cold Press Process

Cold pressed neem oils can be used as insecticides, fungicides, plant shines, and herbal supplements.

- Neem seeds are sorted, ground and pressed under high pressure called expulsion
- The oil contains water and other impurities (waxes etc.) which lead to shorter shelf stability issues after exposure to low temperatures and increases the chances of phytotoxicity
- Pressed oil is filtered through cloth, yielding a cloudy formulation
- Cold pressed neem contains very low levels of azadirachtin (.1-.3%) and are considered non-pesticidal and can cause residue or issues on crop leaf surfaces



Evidence of Phytoxicity from Cold Press Neem at Label Rate

CHENO Process

CHENO, or Clarified Hydrophobic Extract of Neem Oil, contains >0.1% azadirachtin and is a product of a patented process by Certis Biologicals that improves quality without compromising yield for specific agricultural uses.

5-STEP PATENTED CHENO PROCESS

1. Grading Seeds
- Only top-grade seeds are accepted; lower quality seeds removed for cold-pressed oils, cosmetics, and other uses

2. Grinding Seeds
- Seeds are ground and pressed to extract the oil

3. Extraction
- Removes impurities and water (water in the formulation can lead to solidification when exposed to cool temperatures
- Oil is strained again after the water removal process and before packing

4. Clarification
- Advanced, multiple-stage filtration method results in a fine-particle oil to remove azadirachtin and other residues

5. QC Process
- Upon arrival at the US plant, CHENO is filtered again and undergoes rigorous Quality Control for oil impurity, solids and water content
- Once passed for QC, CHENO is packed at Wasco, CA plant for shipment

Why Does the Process Matter?

Neem oil naturally controls insects and diseases in crop production, so the process of selection and extraction is the differentiating factor in its quality, effectiveness and safety for your crops.

CHENO is produced from the highest quality seeds and combats phytotoxicity and azadirachtin residue on plant surfaces.

FEATURES & BENEFITS	CHENO
Patented Process	Yes
Multi-Stage Filtration	Yes
Azadirachtin Content	Minimal
Plant Phyto Potential	Minimal
Shelf-Stable Low Temps	Yes
Disease Control	Good
Insect Control	Good
Mite Control	Good
Environmental Safety	Excellent

FEATURES & BENEFITS OF CHENO

- With less water and impurities, the CHENO is not phytotoxicity (yield is not important to the home gardener)
- Impurities and water in CPNO lead to a cloudy-looking oil product that may contain particulate matter which could lead to clogged sprayers, mixing issues, and uneven application
- CHENO does not contain impurities and water creating shelf stability issues when exposed to low temperatures (less than 50 degrees)
- Neither CHENO nor CPNO contain levels of azadirachtin that will control insects, hence it is not listed as an active ingredient on the label
- CHENO contains azadirachtin at levels that will not cause unsightly residue on the leaf surface



PESTS CONTROLLED

- Aphids
- Mealy Bugs
- Mites
- Rust mites
- Spider mites
- Soft scales

DISEASES CONTROLLED

- Alternaria
- Antracnose
- Early blight
- Leaf blight
- Botrytis
- Greasy spot
- Leaf spot
- Powdery mildew
- Molds
- Scabs
- Rusts
- Shothole

CERTIS Biologicals

Certis Biologicals is the leading producer of Neem Oil in the world. For more information on how it can benefit garden and greenhouse crops, contact your local representative.

1.800.250.5024
www.CertisBio.com/garden