

# Neemix<sup>®</sup>4.5

## INSECT GROWTH REGULATOR

Kills/repels a variety of insect pests including whiteflies, caterpillars, leafminers, aphids, and diamondback moths.

 FOR ORGANIC PRODUCTION

**OMRI**  
**Listed**  
Organic Materials Review Institute

### ACTIVE INGREDIENT:

Azadirachtin .....4.5%

**OTHER INGREDIENTS:** .....95.5%

**TOTAL:** .....100.0%

This product contains 0.34 pounds of azadirachtin per U.S. gallon.

### Net Contents: 1 Quart

EPA Reg. No. 70051-9

EPA Est. No. 44616-MO-01

Lot Number:

### KEEP OUT OF REACH OF CHILDREN WARNING AVISO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.  
(If you do not understand the label, find someone to explain it to you in detail).

Manufactured by  
Certis USA, L.L.C.  
9145 Guilford Road  
Suite 175  
Columbia, MD 21046

**CERTIS**

SEE SIDE/BACK PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS AND FIRST AID

### PRECAUTIONARY STATEMENTS

#### HAZARDS TO HUMANS AND DOMESTIC ANIMALS

#### WARNING

Causes substantial but temporary eye injury. Do not get in eyes or on clothing. Wear goggles and/or face shield. Harmful if absorbed through skin. Avoid contact with skin, eyes, or clothing. Harmful if inhaled. Avoid breathing spray mist. Harmful if swallowed. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco. Remove and wash contaminated clothing before reuse.

#### FIRST AID

**If in eyes:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

**If on skin or clothing:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

**If inhaled:** Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for treatment advice.

**If swallowed:** Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything to an unconscious person.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.  
Hot Line Number: 1-800-255-3924.

#### Personal Protective Equipment:

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category C on an EPA chemical-resistance category selection chart.

#### Applicators and other handlers must wear:

- Long-sleeved shirt and long pants.
- Chemical-resistant gloves, such as barrier laminate or butyl rubber or nitrile rubber or neoprene rubber or polyvinylchloride (PVC) or Viton.
- Shoes plus socks.
- Protective Eyewear

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not re-use them.

#### USER SAFETY RECOMMENDATIONS

Users Should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

#### ENVIRONMENTAL HAZARDS

This product is hazardous to fish and aquatic invertebrates. For terrestrial uses: Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters or rinsate.

## PHYSICAL OR CHEMICAL HAZARDS

**Combustible:** Do not use or store near heat or open flame.

## DIRECTIONS FOR USE

**IT IS A VIOLATION OF FEDERAL LAW TO USE THIS PRODUCT IN A MANNER INCONSISTENT WITH ITS LABELING.**

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

### AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 12 hours.

For early entry into treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, wear:

- Coveralls.
- Chemical-resistant gloves, such as barrier laminate or butyl rubber or nitrile rubber or neoprene rubber or polyvinylchloride (PVC) or Viton.
- Shoes plus socks.
- Protective Eyewear

### NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses. Keep unprotected persons out of treated areas until sprays have dried.

## GENERAL

- Botanical Insecticide Concentrate.
- Kills larval stages of insects only.
- Not for use in food-handling establishments.
- Shake well before using.
- Spraying directly onto the pest and a longer duration of leaf wetting increases effectiveness. Apply in early to mid-morning or late afternoon.
- The pH of spray solution containing Neemix® 4.5 must be kept between 3 and 8. Use spray solutions within several hours of preparation for maximum effectiveness. Do not store diluted solution for later use.
- Do not apply to wilted or otherwise stressed plants, or to newly transplanted material prior to root establishment. Do not apply to known spray sensitive plants without testing.
- NEEMIX® 4.5 has been found to be compatible when used in conjunction with most beneficial insects. Conduct a small trial to assure compatibility before using on a large scale.
- For indoor and outdoor use.

### TANK MIXING

NEEMIX® 4.5 has been found to be compatible with most commonly used fungicides, insecticides, and fertilizers. Check physical compatibility first by using the correct proportion of products in a small jar test. Then, test tank-mix combinations for phytotoxicity on a sample of plants prior to use. This must be done with combinations used before as environmental conditions can alter the interaction between compounds. Due to the wide variation in climatic conditions, cultural practices, and other factors, the user assumes full responsibility for any crop damage or other liability resulting from the use of NEEMIX® 4.5 in a tank mix combination. Do not mix NEEMIX® 4.5 with oxidizing agents such as bleach, or strong acids and bases as they will destabilize the product.

## DIRECTIONS FOR FOOD CROP APPLICATION

### General Directions

- Use care when applying near streams, ponds, lakes or other bodies of water.
- Do not apply NEEMIX® 4.5 when weather conditions favor drift or when the likelihood of runoff is high.

### GREENHOUSE

- For use to control whiteflies, thrips, mealybugs, leafminers, loopers, caterpillars, beet armyworms, and aphids in and around greenhouses and commercial nurseries.
- NEEMIX® 4.5 may be used on all fruits, vegetables, vegetable transplants, and herbs both inside and outside of the greenhouse.
- Dilute NEEMIX® 4.5 at 3.5 to 8.0 fluid ounces per 100 gallons of water (1/4 to 1/2 teaspoon of NEEMIX® 4.5 per gallon of water). Mix thoroughly. Apply at 25-40 psi with hand sprayer or 100-200 psi with power sprayer as a fine spray to both leaf surfaces to runoff. Use 1-2 gallons of spray solution/1,000 sq. feet. Avoid excessive application.
- For low volume application, apply 0.5 pint of NEEMIX® 4.5 per acre in sufficient water to provide adequate coverage.
- Apply sprays on a preventative 7-day schedule or at the first sign of insect presence. This schedule is effective under low insect pressure. Under high insect pressure, apply every 3-4 days.
- For drench applications in greenhouse plantings, use 2.25 fluid ounces per 100 gallons and apply at the rate of 1 quart of diluted solution per square foot of growing media surface. Repeat at 14-day intervals during the growing season.

### Specific Crop Directions

**Application Rate:** Apply 0.25-1 pint (4.0-16.0 fluid oz.) of NEEMIX® 4.5 per acre using suitable ground or aerial application equipment, in a manner to obtain uniform and complete plant coverage. For agronomic crops apply using conventional ground application equipment in a minimum of 30 gallons of water and aerial application equipment in a minimum of 3 gallons of water. Avoid over-spraying to the point of excessive runoff. Refer to table for application rates. Use the low rate as a preventative when pest pressure is low, or if used in conjunction with adulticide products. Otherwise, use the high rate. The maximum application rate is 20 grams active ingredient or less per acre according to the tolerance exemption (40 CFR 180.1119).

### Mode of Action

This product controls targeted insect larvae when ingested or come in contact with it, by interfering with the insects' ability to molt. It is effective on all larval stages and pupae. It also reduces damage by repelling and deterring feeding of all stages of insect.

<b>Application Rate for Whiteflies, Aphids, Leafminers, Armyworms, and Other Pests</b>			
<b>Pest</b>	<b>Rate Neemix® 4.5 Per Acre* (fluid ounces)</b>	<b>Frequency</b>	<b>Remarks</b>
Sweetpotato Whitefly Low Pressure High pressure	4.0 – 7.0 fluid oz. 8.0 – 16.0 fluid oz.	4 – 10 days 3 – 7 days	Foliar application to larvae and nymphs
Aphids	5.0 – 7.0 fluid oz.	7 – 10 days	Suppression and adult feeding deterrence
Leafminer	4.0 – 7.0 fluid oz.	14 – 21 days	Foliar application to larvae and nymphs
Armyworms	4.0 – 10.0 fluid oz.	7 – 10 days	Foliar application to larvae
Others (including) Borers Leafhoppers Leafrollers Loopers	7.0 – 16.0 fluid oz.	7 – 10 days	Foliar application to larvae and nymphs

\*apply in sufficient water to obtain adequate plant coverage.

### **CITRUS, POME AND STONE FRUITS**

Crops (including, but not limited to)

Apples	Jujubes	Peaches
Apricots	Kumquats	Pears
Avocado	Lemons	Plums
Cherries	Limes	Prunes
Crabapples	Nectarines	Quinces
Grapefruits	Oranges	

### **CUCURBITS**

Crops (including, but not limited to)

Balsam pears	Gherkins	Pumpkins
Cantaloupes	Gourds	Squashes
Chinese waxgourds	Honeydew melons	Watermelons
Cucumbers	Mangoes	

### **BULB, COLE AND LEAFY VEGETABLES**

Crops (including, but not limited to)

Asparagus	Collards	Mustard greens
Arugula	Cress	Onions
Broccoli	Endive	Parsley
Bok choy	Fennel	Rhubarb
Brussels sprouts	Garlic	Shallots
Cabbage	Kale	Spinach
Cauliflower	Kohlrabi	Swiss chard
Celery	Leek	Turnip tops
Chinese spinach	Lettuce	Watercress

### **LEGUME AND FRUITING VEGETABLES**

Crops (including, but not limited to)

Beans	Lentils	Soybeans
Chick peas	Peanuts	Tomatoes
Eggplants	Peas	
Ground cherries	Peppers	

### **ROOT AND TUBER VEGETABLES**

Crops (including, but not limited to)

Artichokes	Horseradish	Turmeric
Beets	Parsnips	Turnips
Carrots	Potatoes	Yam beans
Cassava	Radishes	Yams
Ginger	Rutabaga	
Ginseng	Sweet potatoes	

### **SMALL FRUITS AND BERRIES**

Crops (including, but not limited to)

Blackberries	Dewberries	Loganberries
Blueberries	Elderberries	Raspberries
Boysenberries	Gooseberries	Strawberries
Cranberries	Grapes	Youngberries
Currants	Huckleberries	

### **HERBS AND SPICES**

Crops (including, but not limited to)

2 Anise	Cumin	Rosemary
Balm	Curry leaf	Rue
Basil	Dandelion	Sage
Borage	Dill	Savory
Camomile	Fennel	Spearmint
Caraway	Marigold	Sweet bay
Catnip	Majoram	Tarragon
Celery	Mint	Thyme
Chives	Pennyroyal	Wintergreen
Coriander	Peppermint	

### **NUTS**

Crops (including, but not limited to)

Almonds	Cashews	Macadamias
Beech nuts	Chestnuts	Pecans
Brazil nuts	Filberts	Pistachios
Butternuts	Hickory nuts	Walnuts

### **MISCELLANEOUS**

Crops (including, but not limited to)

Cotton	Corn
Sweet Corn	Other crops grown for seed
Alfalfa	Mushrooms

### **DIRECTIONS FOR MUSHROOMS**

**Compost Treatment – Post Pasteurization** – After compost has cooled, but prior to broadcasting spawn, dilute 2-4 ounces of NEEMIX® 4.5 with 25 gallons of water, mix thoroughly, apply as a fine spray over compost surface. (25 gallons treats 1000 sq.ft.).

**Post Planting (Spawning Treatment)** – Dilute 1-2 oz. of NEEMIX® 4.5 with 25 gallons of water, mix thoroughly, and apply as a fine mist to the surface (25 gallons treats 1000 sq.ft.).

(continued next page)

## DIRECTIONS FOR MUSHROOMS (continued)

**Casing Layer Treatment** – Beginning 3 days after casing, dilute 1/2 - 1 oz. of NEEMIX® 4.5 with 25 gallons of water, mix thoroughly, apply as a fine spray to the surface (25 gallons treats 1000 sq.ft.). repeat every 7-10 days.

### INSECT PESTS CONTROLLED BY NEEMIX® 4.5

#### Aphids:

Cotton Aphid  
Green Peach Aphid  
Black Maringed Aphid  
Filbert Aphid

#### Armyworms:

Beet Armyworm  
Fall Armyworm  
Southern Armyworm  
Yellowstriped Armyworm

#### Borers:

Peachtwig Borer  
Squash Vine Borer

#### Caterpillars & Loopers:

Cabbage Looper  
Diamond Moth  
Imported Cabbage Looper  
Navel Orangeworm  
Soybean Looper  
Tobacco Budworm  
Tomato Fruitworm  
Grapeleaf Skeletonizer  
Hornworm  
Fall Webworm  
Lesser Webworm  
Pickleworm  
Rindworm  
Melonworm  
Sod Webworm  
Pecan Nut Casebearer  
Walnut Caterpillars  
Hickory Shuckworms  
Corn Earworms

#### Budworms:

Garden Webworm  
Tomato Pinworm  
Grapefruit Worm  
Filbert Worms

#### Cutworms:

Black Cutworm  
Citrus Cutworm

#### Leafhoppers:

Grape Leafhopper  
Potato Leafhopper  
Variegated Leafhopper  
Aster Leafhopper

#### Leafminers:

Holly Leafminer  
Sepentine Leafminer  
Vegetable Leafminer

#### Leafrollers:

Oblique Banded Leafroller  
Omnivorous Leafroller  
Grape Leafroller  
Fruitree Leafroller  
Blueberry Leafroller  
Filbert Leafroller

#### Moths:

Artichoke Plume Moth  
Codling Moth  
Gypsy Moth  
Diamondback Moth  
Grape Berry Moth

#### Thrips:

Thrips Palmi

#### Whiteflies:

Greenhouse Whitefly  
Silverleaf Whitefly  
Sweetpotato Whitefly

#### Psyllids

#### Spittle Bugs

#### Mealybugs

#### Beetles, Grubs and Weevils:

Pecan Weevils  
Chestnut Weevils  
Colorado Potato Beetle  
Black Vine Weevil  
Twig Girdlers  
Strawberry Beetle  
Potato Flea Beetle  
Mexican Bean Beetle  
Bean Leaf Beetle  
Flea Beetle  
Bollweevil

#### Miscellaneous:

Fruitfly  
Grasshopper  
Squash Bug  
Cabbage Maggot  
Onion Maggot  
Cherry Fruitworm  
Grape Leafhopper  
Pink Bollworm  
Lygus Bug  
San Jose Scales  
Calico Scales  
Frosted Scales  
Pecan Leaf Phylloxera  
Pecan Stem Phylloxera  
Sciarid and Phorid Flies

## STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage and disposal.

**Pesticide Storage:** Keep in original container. Store in a cool, dry place, away from direct sunlight, feed or foodstuffs. Keep container tightly sealed when not in use. Do not store below 50°F (10°C) or above 95°F (35°C).

**Pesticide Disposal:** Wastes resulting from the use of this product must be disposed of on-site or in an approved waste disposal facility.

**Container Disposal:** Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill or by incineration, if allowed by state and local authorities. If burned, stay out of smoke.

## WARRANTY

Certis USA, L.L.C. warrants that the material contained herein conforms to the description on the label and is reasonably fit for the purposes referred to in the directions for use. Timing and method of application, weather, watering practices, nature of soil, the insect problem, condition of the crop, incompatibility with other chemicals not specifically recommended, and other influencing factors in the use of this product are beyond the control of the seller. Buyer assumes all risks of use, storage or handling of this material not in strict accordance with directions given herein. NO OTHER EXPRESS OR IMPLIED WARRANTY OF THE FITNESS OR MERCHANTABILITY IS MADE.

## Chemigation Bulletin

### GENERAL INFORMATION:

Apply this product only through drip (trickle); sprinkler (solid set, lateral move, end tow, sideroll, center pivot, or hand move); flood (basin); furrow; or border irrigation systems. Do not apply this product through any other type of irrigation system.

Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from non-uniform distribution of treated water.

If you have questions about calibration, contact State Extension Service specialists, equipment manufacturers or other experts.

Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place.

A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.

Public water system means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

Chemigation systems connected to public water systems must contain a functional, reduced pressure zone, backflow preventer (RPZ) or the functional equivalent in the water supply line upstream from the point of pesticide introduction. As an option

## CHEMIGATION

Refer to supplemental labeling entitled "Certis's Chemigation Bulletin" for use directions for chemigation. Do not apply this product through any irrigation system unless the supplemental labeling on chemigation is followed.

to the RPZ, discharge the water from the public water system into a reservoir tank prior to pesticide introduction. There shall be a complete physical break (air gap) between the outlet end of the fill pipe and the top or overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe.

The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection.

The pesticide injection pipeline must contain a functional, normally closed, solenoid operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.

The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops, or in cases where there is no water pump, when the water pressure decreases to the point where pesticide distribution is adversely affected.

Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

Do not apply when wind speed favors drift beyond the area intended for treatment.

#### **DRIP TRICKLE CHEMIGATION:**

1. The system must contain a functional check valve, vacuum relief valve and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.
2. The pesticide injection pipeline must contain a functional, automatic, quick-closing valve to prevent the flow of fluid back toward the injection pump.
3. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
4. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
5. The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
6. Systems must use a metering pump such as a positive displacement injection pump (i.e., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
7. Dilute the product in water following the label mixing directions. It may be premixed in a supply tank with water, fertilizer, or other appropriate tank-mixed agricultural chemicals. Agitation is necessary. Apply to moderately moist soils. Use volumes that thoroughly wet the soil but that do not cause significant runoff or excessive drip from pots. Application should be

continuous in sufficient water to apply the application rate evenly to the entire treated area.

#### **SPRINKLER CHEMIGATION:**

1. The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.
2. The pesticide injection pipeline must also contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
3. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
4. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
5. The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
6. Systems must use a metering pump such as a positive displacement injection pump (i.e., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
7. Dilute the product in water following the label mixing directions. It may be premixed in a supply tank with water, fertilizer, or other appropriate tank-mixed agricultural chemicals. Agitation is necessary. Apply when soils are moderately moist. Use volumes that thoroughly wet the foliage and/or soil but that do not cause significant runoff or excessive drip from pots. Application should be continuous in sufficient water to apply the application rate evenly to the entire treated area.
8. Do not apply when wind speed favors drift beyond the area intended for treatment.

#### **FLOOD (BASIN), FURROW AND BORDER CHEMIGATION:**

1. Systems using a gravity flow pesticide dispensing system must meter the pesticide into the water at the head of the field and downstream of a hydraulic discontinuity such as a drop structure or weir box to decrease potential of water source contamination from the backflow if water flow stops.
2. Systems utilizing a pressurized water and pesticide injection system must meet the following requirements:
  - a. The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.
  - b. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
  - c. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the

intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.

- d. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
  - e. The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
  - f. Systems must use a metering pump, such as a positive displacement injection pump (i.e., diaphragm pump), effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
3. Dilute the product in water following the label mixing directions. It may be premixed in a supply tank with water, fertilizer, or other appropriate tank-mixed agricultural chemicals. Agitation is necessary. Apply to moderately moist soils. Use volumes that thoroughly wet the soil but that do not cause significant runoff. Application should be continuous in sufficient water to apply the application rate evenly to the entire treated area.