

Neemix[®] 4.5



STATE OF HAWAII
Department of Agriculture

ACCEPTED
LICENSE NO. **8033.22**

INSECT GROWTH REGULATOR

BIOLOGICAL INSECTICIDE

An Insecticide for Use on Vegetables, Fruits, Turf (Including Commercial Lawns), and other Crops Grown in the Field or In and Around Commercial Nurseries, Greenhouses, and Mushroom Houses. Kills/repels a variety of insect pests including whiteflies, loopers, caterpillars, leafminers, psyllids, mealybugs, and larvae of diamondback moths.

ACTIVE INGREDIENT:

Azadirachtin 4.5%

OTHER INGREDIENTS: 95.5%

TOTAL: 100.0%

This product contains 0.39 lb. (175 g.) of azadirachtin per US gallon

KEEP OUT OF REACH OF CHILDREN CAUTION

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

See attached booklet for additional Precautionary Statements, First Aid Statements, Directions for Use, and Storage and Disposal Statements.



CAN BE USED IN ORGANIC PRODUCTION



PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION: Avoid contact with skin, eyes or clothing. Harmful if swallowed or inhaled. Avoid breathing vapors or spray mist. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. 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, butyl rubber, nitrile rubber, neoprene rubber, polyvinyl chloride (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 may be 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 AND 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.

**Net Contents: One Quart
or 32 fl. oz. (946mL)**

Lot Number:

EPA Reg. No. 70051-9

EPA Est. No. 39578-TX-01

Manufactured for:

Certis USA
9145 Guilford Road
Suite 175
Columbia, MD 21046

CERTIS

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 workers entry into treated areas during the restricted entry interval (REI) of 4 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, butyl rubber, nitrile rubber, neoprene rubber, 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 Standards for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, or greenhouses. For other uses including golf courses, and other non-agricultural uses, do not enter treated areas without protective clothing until sprays have dried.

PREHARVEST INTERVAL

NEEMIX[®] 4.5 can be applied up to and including the day of harvest (zero PHI). Individual state regulations may vary and should be consulted for allowable preharvest interval.

MODE OF ACTION

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

SPRAY EQUIPMENT

Use any suitable ground, aerial, or hand application equipment that allows for uniform coverage of the targeted treatment area.

GENERAL INFORMATION

- Broad Spectrum Insect Growth Regulator Insecticide
- Not for use in food-handling establishments.
- Shake well before using.
- Kills only immature stages (larvae or nymphs) of insects. Treated larvae may die as pupae.
- Make applications when pests first appear and are in their early larval stages. Repeat applications every 7 days or as needed.
- Botanical Insecticide Concentrate.
- 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.
- Use with care when applying near streams, ponds, lakes or bodies of water.
- Do not apply NEEMIX[®] 4.5 when weather conditions favor drift or the likelihood of runoff is high.
- For best results, add a spreader-sticker or oil-based adjuvant (such as methylated seed oil) at the label rate.

This product may be pre-mixed in a supply tank with water, fertilizer or other appropriate agricultural chemicals. Agitation is necessary (see Mixing Directions). Crop injury or lack of effectiveness can result if uniform distribution is not achieved.

When pest populations are high, use the higher label rates.

TANK MIXING

NEEMIX® 4.5 Insect Growth Regulator, 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 USE ON FIELD-GROWN FOOD CROPS

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.

SPECIFIC CROP/PEST DIRECTIONS:

Application Rate: Apply 0.25 – 1 pint (4 – 16 fl. 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 the table below for application rates against selected pests. Use the low rate as a preventative when pest pressure is low, or if used in conjunction with adjuvant 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).

Application Rates for Whiteflies, Aphids, Leafminers, Worms, and Other Pests

Pest	Rate of Neemix® 4.5 Per Acre*	Frequency	Remarks
Whiteflies: Low Pressure High Pressure	4 – 7 fl. oz. 8 – 16 fl. oz.	4 – 10 days 3 – 7 days	Foliar application against nymphs
Aphids	5 – 7 fl. oz.	7 – 10 days	Suppression of nymphs and adult feeding deterrence
Leafminer (<i>Liriomyza</i> spp. and Citrus Leafminer <i>Phyllocnistis citrella</i>)	4 – 7 fl. oz.	14 – 21 days	Foliar application against larvae and nymphs
Lepidoptera larvae (caterpillars or worms) feeding on foliage or fruit	4 – 10 fl. oz.	7 – 10 days	Foliar application against larvae
Others (including): Borers, Leafhoppers, Leafrollers, Loopers	7 – 16 fl. oz.	7 – 10 days	Foliar application against larvae or nymphs

*Apply in sufficient water to obtain adequate plant coverage, typically 30 – 100 gallons per acre by ground or 3 – 5 gallons per acre by air.

DIRECTIONS FOR USE IN GREENHOUSES (OR OTHER COVER) AND PLANT NURSERIES

For Use on Vegetables, Melons, Strawberries, and Other Food Crops Raised for Transplanting to Production Fields. For Use on Bearing and Nonbearing Fruit and Nut Trees, Grapevines, Caneberries, and Other Small Fruits.

Apply NEEMIX® 4.5 at the indicated rates in sufficient water to ensure adequate plant coverage. Use 1-2 gallons of spray solution per 1,000 square feet, or a minimum of 30 gallons of water per acre for conventional application equipment (3 gallons of water per acre for low/ultralow volume equipment).

Pests controlled by Neemix® 4.5	Rate of Neemix® 4.5 per 100 gallons of water*	Remarks
Aphids	10 – 16 fl. oz.	Foliar application for suppression and adult feeding deterrence.
Armyworms	4 – 16 fl. oz.	Foliar application against larvae.
Borers , including Peach Twig Borer, Peachtree Borer, and Squash Vine Borer	4 – 16 fl. oz.	Foliar application against young larvae before boring or tunneling in the plant.
Caterpillars, Loopers , and other Lepidoptera Larvae (worms)	4 – 16 fl. oz. (Except as noted at right)	Corn Earworm, Diamondback Moth, Hickory Shuckworm, Imported Cabbageworm (larvae of Cabbage Butterfly), and Navel Orangeworm: Use 10 – 16 fl. oz. /100 gal. Artichoke Plume Moth: Apply at 16 fl. oz. /100 gal.
Colorado Potato Beetle & other leaf-feeding beetles	4 – 16 fl. oz.	Foliar application against leaf-feeding larvae.
Cutworms	5 – 16 fl. oz.	Foliar application against larvae feeding on leaves or stems.
Leafhoppers	10 – 16 fl. oz.	Foliar application against nymphs.
Leafminers: <i>Liriomyza</i> spp. and citrus leafminer (<i>Phyllocnistis citrella</i>)	6 – 16 fl. oz.	Foliar application against larvae. Mix with approved oil-based adjuvant for best results.
Leafrollers	4 – 16 fl. oz.	Foliar application against larvae.
Scales	6 – 16 fl. oz.	Foliar or stem application targeting crawler stages.
Whiteflies	6 – 16 fl. oz.	Foliar application against nymphs. Spray should be directed to undersides of leaves.

*When using lower rates (less than 10 fl. oz.), combine NEEMIX® 4.5 with an approved adjuvant such as a non-phytotoxic crop oil, up to 1% for improved spray coverage and translaminar uptake. Always use sufficient spray volume to ensure good coverage of all plant parts. Treat early and target youngest larvae or nymphs for best control. Repeat applications every 7-10 days or as needed to maintain control.

DIRECTIONS FOR COMMERCIAL LAWNS AND TURF

Surface-Feeding Insects:

For use to control cutworms, armyworms, sod webworms, crickets, chinch bugs, leafhoppers, and grasshoppers.

Apply at first sign of pest presence or damage to turf. Do not apply if rain is forecast within the next 24 hours.

Apply 1 quart – 3 gallons of NEEMIX® 4.5 per acre (or 0.75 – 9 fluid ounces per 1,000 square feet) using enough spray volume to obtain thorough coverage and penetration of the turf canopy. Use 2 – 5 gallons of diluted material per 1,000 square feet, or 50 – 100 gallons of diluted material per acre.

The treated area may be lightly irrigated for 3 – 5 minutes after application if desired to increase penetration of the turf surface. However, do not water turf again for 2 days after application.

Reapply as needed to maintain control of turf damage. Be sure to treat under shrubs and plants bordering houses or other structures.

Subsurface-Feeding Insects:

Mow and irrigate turf prior to application. The treated area may be lightly irrigated for 3 – 5 minutes after application if desired to increase penetration of the turf surface. Do not water turf again within 24 hours after application. Do not mow again within 3 days after application.

For use to control white grubs (Japanese beetles, European chafers, dung beetles, June beetles, green June beetles, May beetles, annual white grubs, grub beetles, southern masked chafers, etc.) and crane fly larvae (leatherjackets):

- For white grubs, make application soon after adults emerge in summer (1 – 3 weeks after first sign of adults). Leatherjackets should be targeted as young larvae while feeding near the soil surface.
- Apply 1 quart – 3 gallons of NEEMIX® 4.5 per acre (0.75 – 9 fluid ounces per 1,000 square feet) using enough spray volume to obtain thorough coverage and penetration of the turf. Use 50 – 100 gallons of diluted material per acre, or 2 – 5 gallons of diluted material per 1,000 square feet.

For use to control mole crickets:

- Apply 1 quart – 3 gallons of NEEMIX® 4.5 per acre (0.75 – 9 fluid ounces per 1,000 square feet) using enough spray volume to obtain thorough coverage. Use 2 – 5 gallons of diluted material per 1,000 square feet, or 50 – 100 gallons of diluted material per acre.
- For best results, apply when nymphs are small, in the early spring. If necessary, reapply at 1 – 2 week intervals.

For use to control billbugs:

- Apply in mid to late spring or at first sign of pest emergence or damage.
- Apply 1 quart – 3 gallons of NEEMIX® 4.5 per acre (0.75 – 9 fluid ounces per 1000 square feet) using enough spray volume to obtain thorough coverage. Use 50-100 gallons of diluted material per acre, or 2 – 5 gallons of diluted material per 1,000 square feet.
- Reapply as necessary. Repeat treatment in early to mid fall to control possible second generation.

Nematodes:

Apply 1 quart – 3 gallons of NEEMIX® 4.5 per acre (0.75 – 9 fluid ounces per 1,000 square feet) using enough spray volume to obtain thorough coverage. Use 50-100 gallons of diluted material per acre. Use 2 – 5 gallons of diluted material per 1,000 square feet. Repeat as necessary.

DIRECTIONS FOR MUSHROOMS

Compost Treatment (Post-Pasteurization): After the compost has cooled, but prior to broadcasting spawn, dilute 2 – 4 fl. oz. of NEEMIX® 4.5 with 25 gallons of water, mix thoroughly, and apply as a fine spray over the compost surface (25 gallons treats 1,000 square feet).

Post Planting (Spawning Treatment): Dilute 1 – 2 fl. oz. of NEEMIX® 4.5 with 25 gallons of water, mix thoroughly, and apply as a fine spray to the surface (25 gallons treats 1,000 square feet).

Casing Layer Treatment: Beginning 3 days after casing, dilute 0.5 – 1 fl. oz. of NEEMIX® 4.5 with 25 gallons of water, mix thoroughly, and apply as a fine spray to the surface (25 gallons treats 1,000 square feet). Repeat every 7 – 10 days.

STORAGE AND DISPOSAL

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

PESTICIDE STORAGE: Do not store above 100°F or below -20°F for extended periods of time. Keep containers tightly closed when not in use.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING: Non-refillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

Then offer for recycling, if available or puncture and dispose of in a sanitary landfill, or by incineration, or if allowed by state and local authorities, by burning. 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. To the extent consistent with applicable law, 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.

INSECTS AND OTHER PESTS CONTROLLED BY NEEMIX® 4.5

Aphids, such as:

Apple Aphid	Filbert Aphid	Potato Aphid
Blackmarginated Aphid	Green Peach Aphid	Red Aphid
Cabbage Aphid	Melon Aphid	Woolly Apple Aphid
Cotton Aphid	Pea Aphid	

Beetle Larvae, Weevil Larvae, and Grubs, such as:

Bark Beetles	Colorado Potato Beetle	Pecan Weevil
Bean Leaf Beetle	Cucumber Beetles	Potato Flea Beetle
Billbugs	Flea Beetles	Strawberry Beetles
Black Vine Weevil	Japanese Beetle	Strawberry Root Weevil
Blistert Beetles	Japanese Weevil	Strawberry Weevil
Bluegrass Weevil	June Beetles	Twig Girdlers
Boll Weevil	May Beetle	White-fringed Beetle
Chafers (see list below)	Mexican Bean Beetle	Wireworms
Chestnut Weevil		

Borers, such as:

Mint Root Borer	Peachtree Borer	Southwestern Corn Borer
European Corn Borer	Peach Twig Borer	Squash vine borer

Bugs, such as: Chinch Bug, *Lygus* Bugs, Stink Bugs (all types), and Squash Bugs

Cankerworms, such as: Elm Spanworm, Fall Cankerworm, Linden Looper, and Spring Cankerworm

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INSECTS AND OTHER PESTS CONTROLLED BY NEEMIX® 4.5 (continued)

Armyworms, Bollworms, Budworms, Caterpillars, Fruitworms, Loopers, Webworms, and Other Worms (Lepidoptera larvae), such as:

Armyworms	Hornworms	Soybean Looper
Beet Armyworm	Imported Cabbageworm	Spruce Budworm
Bollworm	Lawn Armyworm	Tent Caterpillar
Borers (see list above)	Leafrollers (see list below)	Tobacco Budworm
Cabbage Looper	Melon Worm	Tobacco Hornworm
Cabbage Butterfly	Melon Rindworm	Tomato Fruitworm
Cherry Fruitworm	Moth Larvae (see list below)	Tomato Hornworm
Corn Earworm	Navel Orangeworm	Tomato Pinworm
Cutworms (see list below)	Pecan Nut Casebearer	Walnut Caterpillar
Dagger Moth	Pickleworms	Western Grapeleaf Skeletonizer
Diamondback Moth	Pink bollworm	Western Spruce Budworm
Fall Armyworm	Rindworm	Western Yellowstriped Armyworm
Grapefruit Worm	Red-humped Caterpillar	Yellowstriped Armyworm
Grape Leafhopper	Saltmarsh Caterpillar	
Grapeleaf Skeletonizer	Southern Armyworm	
Hickory Shuckworm		

Chafers, such as: European Chafer, Northern Masked Chafer, Rose Chafer, and Southern Masked Chafer

Crickets, such as: Mole Cricket and Mormon Cricket

Cutworms, such as: Black Cutworm, Citrus Cutworm, Climbing Cutworm, Western Bean Cutworm, and Variegated Cutworm

Grasshoppers and Locusts

Leafhoppers and Leafliers

Leafhoppers, such as: Aster Leafhopper, Grape Leafhopper, Potato Leafhopper, and Variegated Leafhopper

Leafminers, such as: Citrus Leafminer, Pea Leafminer, Serpentine Leafminer, and Vegetable Leafminer

Leafrollers, such as:

Blueberry Leafroller	Grape Leafroller	Omnivorous Leafroller
Filbert Leafroller	Obliquebanded Leafroller	<i>Pandemis</i> Leafroller
Fruittree Leafroller		

Leaf perforators

Maggots (Fly larvae), such as:

Cabbage Maggot	Leatherjackets	Phorid Flies
Caribbean Fruit Fly	Mediterranean Fruit Fly	Seed Corn Maggot
Crane Fly	Mushroom Fly	Sciarid Flies
Fruit flies	Melon Fly	Shore Fly
Fungus Gnat	Onion Maggot	Walnut Husk Fly
Hessian Fly	Oriental Fruit Fly	

Marsh Flies, Crane Flies, and Leatherjackets

Mealybugs

Millipedes

Moth larvae, such as:

Artichoke Plume Moth	Gypsy Moth	Sunflower Moth
Codling Moth	Light Brown Apple Moth	Tiger Moth
Diamondback Moth	Oriental Fruit Moth	Tufted Apple Bud Moth
European Grapevine Moth	Sunflower Bud Moth	Tussock Moth

Nematodes (suppression)

Phylloxera, such as: Grape Phylloxera, Pecan Leaf Phylloxera, Pecan Stem Phylloxera

Psyllids, such as: Asian Citrus Psyllid, Pear Psylla, Potato Psyllid, Tomato Psyllid

Sawflies

Scale insects, such as:

Black Scale	Cottony-cushion Scale	Purple Scale
Brown Soft Scale	Florida Red Scale	San Jose Scale
California Red Scale	Frosted Scales	Tea Scale
Calico Scale	Green Scale	Wax Scale

Sowbugs (Pillbugs)

Spittlebugs

Thrips, such as:

Citrus Thrips	Onion Thrips	Thrips palmi
Flower Thrips	Pear Thrips	Western Flower Thrips
Melon Thrips		

Webworms, such as: Fall Webworm, Garden Webworm, Lesser Webworm, and Sod Webworm

Whiteflies, such as: Greenhouse whitefly, Silverleaf Whitefly, and Sweet Potato Whitefly

CROPS ON WHICH NEEMIX® 4.5 CAN BE USED (continued)

Herbs and Spices, such as:

Allspice	Chives	Lemongrass	Rue
Angelica	Cilantro	Lovage	Saffron
Anise	Cinnamon	Mace	Sage
Annatto	Cloves	Marigold	Savory
Balm	Coriander	Marjoram	Spearmint
Basil	Costmary	Mint	Sweet Basil
Borage	Cumin	Mustard Seed	Sweet Bay
Burnet	Curry Leaf	Nasturtium	Tansy
Camomile	Dill	Nutmeg	Tarragon
Caper Buds	Fennel	Pennyroyal	Thyme
Caraway	Fenugreek	Pepper	Vanilla
Cardamom	Horehound	(Black or White)	Wintergreen
Cassia	Hyssop	Poppy Seed	Woodruff
Catnip	Juniper Berry	Rosemary	Wormwood
Celery Seed	Lavender		

Leafy Vegetables, such as:

Arugula	Chinese Spinach	Dock (Sorrel)	Purslane
Cardoon	Corn Salad (Mâche)	Endive (Escarole)	Radicchio
Celery	Chrysanthemum (Edible)	Fennel	Rhubarb
Celtuce	Cress (all types)	Lettuce (all types)	Spinach
Chervil	Dandelion	Orach	Swiss Chard
Chinese Celery		Parsley	

Legumes, such as:

Alfalfa	Cowpeas	Lupins (all types)	Peanuts
Beans (all types)	Edamame	Peas (all types)	Soybean
Chickpea (Garbanzo)	Lentils		

Pome Fruits, such as:

Apple	Jujube	Mayhaw	Quince
Crabapple	Loquat	Pear	

Root and Tuber Crops, such as:

Beet (all types)	Dasheen (taro)	Parsnip	Sweet Potato
Carrot	Ginger	Potato	Turneric
Cassava	Ginseng	Radish	Turnip
Celeriac	Horseradish	Rutabaga	Yam
Chervil	Japanese radish	Salsify	Yam bean
Daikon	Jicama	Sugarbeet	

Small Fruits and Berries, such as:

Blackberry (all types)	Dew Berry	Huckleberry	Raspberry
Blueberry	Elderberry	Loganberry	Strawberry
Boysenberry	Gooseberry	Olives	Youngberry
Currant	Grapes (all types)	Olallieberry	

Stone Fruits, such as:

Apricot	Nectarine	Plum	Pluot
Aprium	Peach	Plumcot	Prune
Cherry			

Tree Nuts, such as:

Almond	Cashew	Filberts (Hazelnuts)	Pecan
Beech Nut	Chestnut	Hickory Nuts	Pistachio
Brazil Nut	Chinquapin	Macadamia	Walnuts
Butternut			

Tropical and Subtropical Fruits, such as:

Abiu	Durian	Malanga	Passion Fruit
Avocado	Guava	Mango	Plantain
Breadfruit	Longan	Mangosteen	Starfruit
Banana	Lychee	Papaya	Sugar Apple
Date			

Turfgrass, such as:

Annual Bluegrass	Bermuda grass	Perennial Ryegrass	Wheatgrass
Annual Ryegrass	Centipede Grass	St. Augustine Grass	Zoysia Grass
Bentgrass	Fescue	Seashore Paspalum	

Miscellaneous Crops, such as:

Artichoke	Edible flowers	Mushrooms (all types)	Sugarcane
Asparagus	Feijoa	Palm	Tamarillo
Birdseed	Figs	Pawpaw	Tea
Cacao	Hops	Persimmon	Tobacco
Coffee	Guayule	Pineapple	Waterchestnut
Corn (all types)	Kiwi	Pomegranate	Watercress
Cotton			

CROPS ON WHICH NEEMIX® 4.5 CAN BE USED

Brassica (Cole) Crops, such as:

Bok Choy	Cauliflower	Cavalo Broccolo	Mustard Greens
Broccoli	Chinese Cabbage	Collards	Mizuna
Broccoli Raab	(Bok Choy, Gai)	Kale	Rapini
Brussels Sprouts	Lon, Napa)	Kohlrabi	Turnip Tops
Cabbage			

Bulb Vegetables, such as: Garlic, Leek, Onion (all types), and Shallot

Citrus Fruits, such as:

Calamondin	Kumquat	Mandarin (Tangerine)	Satsuma Mandarin
Citrus citron	Lemon	Orange (all types)	
Grapefruit	Lime	Pummelo	

Cucurbit Vegetables and Melons, such as:

Balsam pear	Citron Melon	Honeyballs	Pumpkin
(Bitter Melon)	Crenshaw	Honeydew	Squash (all types)
Cantaloupe	Cucumber	Mango Melon	Watermelon
Casaba	Gherkin	Muskmelon	Zucchini
Chinese Waxgourd	Gourds		

Feed and Forage Crops, such as: Alfalfa, Clover, *Lespedeza*, Trefoil, Vetch (all types), and any grass grown for hay, forage, or animal feed.

Fruiting Vegetables, such as:

Eggplant	Okra	Peppers (all types)	Tomato
Ground Cherry	Pepino	Tomatillo	

(continued)

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 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.