

Pest Management for Vegetable Bedding Plants Grown in Greenhouses

For information on pest management for vegetable bedding plants see: “Pest Management for Vegetable Bedding Plants Grown in Greenhouses”
<http://www.hort.uconn.edu/ipm/greenhs/htms/vegbedpl.htm>

Table 1. Selected Insecticides Labeled for Insects and Mites on Vegetable Bedding Plants

Insecticide	Target Pests	Labeled Crops	Comments
Acetamiprid (Tristar 30 SG) 12 hr. REI Group 4A	Aphids, psyllids, mealybugs, leafhoppers, caterpillars, hard and soft scales, plant bugs, whiteflies, fungus gnat larvae, thrips, leaf eating beetles, leaf miners	Vegetable transplants (See supplemental label)	Contact insecticide with translaminar activity. The addition of a surfactant may improve efficacy for certain pests (see supplemental label).
Azadirachtin- Group 18B (Aza-Direct) 4 hr. REI Organic product	Aphids, beetles, weevils, thrips, true bugs, caterpillars, leafhoppers, leafminers, whiteflies, fungus gnat larvae	Many vegetables including bulb, cole, cucurbit, leafy and fruiting types (eggplant, tomato, peppers) (see specific labels)	Insect growth regulator for immature stages of insects. Repeat applications needed. Repels some insects and can be used as an antifeedant.
----- (Azatrol) 4 hr. REI Organic product	Beetles, weevils, thrips, true bugs, leafhoppers, cutworms, loopers, fungus gnat larvae		
----- (AzaGuard) 4 hr. REI Organic Product	Leafminers, soft scales, mealybugs, thrips, aphids, fungus gnat larvae, whiteflies, caterpillars, beetles, weevils		
----- (Azahar) 4 hr. REI Organic product	Beetles, weevils, thrips, true bugs, leafhoppers, whiteflies, aphids, leafrollers, cutworms, loopers, fungus gnat larvae		
----- (Azatin XL) 4 hr. REI	Aphids, caterpillars & loopers, fungus gnat larvae, leafhoppers, leafminers, thrips, whiteflies		

(Molt X) 4 hr. REI	Whiteflies, leafminers, soft scales, mealybugs, thrips, aphids, fungus gnat larvae, caterpillars, beetles, weevils		
----- (Ornazin 3% EC) 12 hr. REI	----- Aphids, caterpillars & loopers, cutworms, leafminers, leafhoppers, thrips, whiteflies, fungus gnat larvae, beetles, weevils		
----- (Neemix 4.5) 12 hr. REI Organic product	----- Aphids, beetles, caterpillars, fungus gnat larvae, leafhoppers, leafminers, thrips, whiteflies		
<i>Bacillus thuringiensis</i> subsp. <i>aizawai</i> (XenTari) 4 hr. REI Group 11B Organic product	Certain caterpillars (see label)	Brassica and fruiting vegetables in the greenhouse (see label)	Stomach poison that must be ingested to be active. Most effective against small, newly hatched larvae. Insects stop feeding and dies 1 to 5 days later.
<i>Bacillus thuringiensis</i> subsp. <i>kurstaki</i> (DiPel Pro DF) 4 hr. REI Group 11B Organic product	Certain caterpillars (see label)	Many vegetables including leafy, cole, and fruiting types (see label)	Stomach poison that must be ingested to be active. Thorough coverage of all plant parts is important. Most effective against young, newly hatched larvae. Insects stop feeding and dies 1 to 5 days later.
<i>Bacillus thuringiensis</i> subsp. <i>israelensis</i> (Gnatrol WDG) 4 hr. REI Group 11A1 Organic product	Fungus gnat larvae	Vegetable plants such as leafy and cole crops, cucumbers, peppers, tomatoes and eggplants	Stomach poison that must be ingested to be active. Most effective against first instar larvae. Apply as soil drench to control fungus gnat larvae. Larvae must ingest material to be killed. May be applied through drip or sprinkler irrigation system. Do not combine with fungicides or fertilizers containing copper or chlorine.

<p><i>Beauveria bassiana</i> (Botanigard ES) 4 hr. REI(Botanigard 22WP) 4 hr. REI (Mycotrol O) 4 hr. REI Organic product (Naturalis L) 4 hr. REI</p>	<p>Aphids, thrips, whitefly, psyllids, mealybugs, leafhoppers, plant bugs (See labels for more information)</p>	<p>Many vegetables including cole crops, greens, eggplant, peppers, and squash. Do not use ES formulations on tomatoes.</p>	<p>Contact insecticide. Active ingredient is an insect killing fungus. To be effective needs relative humidity greater than 70% and 65-75°F for 8 to 10 hours. Treat when insect populations are low. Repeated applications may be needed.</p>
<p>Bifenazate (Floramite SC) 12 hr. REI Group 25</p>	<p>Spider mites</p>	<p>Greenhouse tomatoes. Varieties greater than one inch in diameter when mature.</p>	<p>Contact miticide. Active against all stages of the two-spotted spider mites. Not effective against rust mites or broad mites. Relatively inactive against beneficial predatory mites.</p>
<p>Buprofezin (Talus 40SC Insect Growth Regulator) 12 hr. REI Group 16</p>	<p>Whiteflies, mealybugs, leafhoppers</p>	<p>Greenhouse tomatoes</p>	<p>Insect growth regulator active against nymph stages. Thorough coverage of all plant parts is important. Chitin synthesis inhibitor, suppresses oviposition of adults and reduces viability of eggs. Treated pests may remain alive for 3 to 7 days, but feeding damage is low.</p>
<p>Chlorfenapyr (Pylon) 12 hr. REI Group 13</p>	<p>Caterpillars (including hornworms), spider mites, broad mites, western flower thrips</p>	<p>Tomato, tomatillo, ground cherry, peppers, eggplant, pepinos. Do not use on tomato varieties with a diameter of less than one inch when mature.</p>	<p>Insecticide/miticide with contact and translaminar activity. Active on larvae and nymphs of spider mites and thrips. See label for resistant management guidelines.</p>
<p>Dinotefuran (Safari 20 SG) 12 hr. REI Group 4A</p>	<p>Aphids, leafminers, mealybugs, thrips (suppression), whiteflies (including sweet potato whiteflies – B and Q biotypes)</p>	<p>Many vegetable transplants grown in enclosed structures (see label). Do not apply to greenhouse grown vegetables.</p>	<p>Systemic insecticide. Do not make more than one application per crop.</p>
<p>Etoxazole (TetraSan 5 WDG) 12 hr. REI Group unknown</p>	<p>Spider Mites</p>	<p>Indoor grown tomatoes (See supplemental label)</p>	<p>Miticide with contact and translaminar activity. Available in 2 oz. water soluble packets. Active on mite eggs and nymphs. Does not kill adults.</p>

Horticultural oil Petroleum Oil (Ultra-Pure Oil) (4 hr. REI NC (Pure Spray Green) Organic product	Aphids, leafminers, mites, thrips, whiteflies, leafhoppers	Many vegetables (see labels for specific crops)	Works by contact. Thorough coverage of all plant parts is important. Foliar injury may occur if applied during humid conditions. See labels for information on plant safety. All applications should be preceded by a phytotoxicity check to ensure that the material is safe for that particular plant variety.
Petroleum Oil (Saf-T-Side) 4 hr. REI NC Organic product	Aphids, leafhoppers, leafminers, thrips, mites, whiteflies	Vegetable crops (see label)	
Petroleum Oil (SuffOil-X) 4 hr. REI NC Organic product	Aphids, leafhoppers, leafminers, mites, thrips, whiteflies	Vegetable crops (see label)	Works by contact. Thorough coverage of all plant parts is important. Foliar injury may occur if applied during humid conditions. See label for information on plant safety.
Paraffinic Oil-White Mineral Oil (JMS Stylet Oil) 4 hr. REI (Organic JMS Stylet Oil) Organic product	Leafhoppers, leafminers, mites, whiteflies	Many vegetables (see label)	Works by contact. See label for information on plant safety.
Imidacloprid (Marathon II) 12 hr. REI Group 4A ----- (Marathon 60WP) 12 hr. REI Group 4A	Aphids, leafhoppers, leafminers, leafhoppers, thrips (suppression), mealybugs, whiteflies, fungus gnat larvae ----- Aphids, fungus gnat larvae, leafhoppers, leafminers, mealybugs, thrips (suppression), whiteflies	Vegetable bedding plants intended for resale only ----- Vegetable bedding plants intended for resale only.	Systemic insecticide. Many other generic products are available including (but not limited to) Imida E Pro 60 WSP QualiPro Imidacloprid 2F
Insecticidal soap Potassium salts of fatty acids (M-Pede) 12 hr. REI NC Organic product	Aphids, mites, thrips, whiteflies, broad mites, leafminers, leafhoppers	Many vegetables including bulb, cole, leafy, fruiting and cucurbit types	

<p>Iron phosphate (Sluggo Snail and Slug Bait) 0 hr. REI NC Organic product</p>	<p>Slugs and snails</p>	<p>Many vegetables (see label)</p>	<p>Ingestion causes the slugs and snails to cease feeding, become less mobile and begin to die in 3 to 6 days. Best applied in the evening. Non-toxic to cats and dogs.</p>
<p>Neem Oil (Triact 70) 4 hr. REI Organic Product (Trilogy) 4 hr. REI Organic product</p>	<p>Mites and insects (whiteflies, aphids, leafhoppers)</p> <hr/> <p>Aphids, mites, mealybugs Whiteflies and thrips (suppression)</p>	<p>Many vegetable transplants (see labels)</p>	<p>Works by contact. Thorough coverage of all plant parts is important. Refer to label for information on plant safety and precautions for use in the greenhouse.</p>
<p>Parasitic nematodes (NemaShield, Nemasys, Scanmask)</p>	<p>Fungus gnat larvae Nemasys: western flower thrips</p>	<p>Greenhouse vegetables</p>	<p>Available in packages. Remove screens and filters from fertilizer injector or sprayer. Nematodes are very sensitive to ultra violet light and desiccation. For soil dwelling pests such as fungus gnat larvae: Drench on soil surface and then water in. Apply to moist growing media at temperatures between 50-85 °F. For western flower thrips (Nemasys). Foliar application. Do not apply in direct sunlight. Lightly mist plants before application. Efficacy will be variable depending upon relative humidity, temperature, concentration, frequency of application and insect growth stage.</p>
<p>Pyrethrins (PyGanic EC) 12 hr. REI Group 3A Organic product</p>	<p>Aphids, caterpillars, fungus gnat adults, thrips, leafhoppers, whiteflies and others</p>	<p>Many vegetables including bulb, leafy, cole, fruiting and cucurbit types</p>	<p>Contact insecticide. Provides rapid knockdown of pests.</p>

Pyrethrins plus PBO (Pyrethrum TR aerosol) 12 hr. REI Group 3A	Aphids, cabbage worms, adult fungus gnats, mealybugs, thrips, whiteflies and others	Many vegetables including bulb, leafy, cole, fruiting and cucurbit types	Contact insecticide. See label for specific directions for placement and use for successful application.
----- (Pyreth-It Formula 2) 12 hr. REI Group 3A	----- Aphids, caterpillars, fungus gnat adults, leafhoppers, beetles, thrips, whiteflies and others.	----- Many different vegetable crops (see label)	----- Contact insecticide. May be combined with other insecticides.
Pyronyl Crop Spray (Pyrethrins & PBO) 12 hr. REI Group 3 and 27A	Aphids, caterpillars, fungus gnats, leafhoppers, leafminers, mealybugs, plant bugs, thrips, whiteflies and others	Many different vegetables (see label)	Contact insecticide.
Pyriproxyfen (Distance Insect Growth Regulator) 12 hr. REI Group 7C	Foliar spray for whiteflies (greenhouse & sweetpotato) and aphids (suppression) Apply as a sprench (growing media surface spray or drench) for fungus gnat and shore fly larvae	See supplemental label for use on indoor-grown fruiting vegetables. Do not apply to tomato varieties less than one inch in diameter or to non-bell peppers.	Insect growth regulator. See label for specific use instructions on rates and plant safety for use as a drench or sprench (soil surface spray) against fungus gnats or shore flies. Do not make more than 2 applications per season.
Soybean Oil (Golden Pest Spray Oil) 4 hr. REI NC Organic product	Aphids, mites, leafminers, certain caterpillars, whiteflies, thrips and others	Vegetables such as cabbage, cauliflower, cucurbits, lettuce, melon, peppers, squash and tomatoes	Works by contact. See label for information on plant safety.
Spirotetramat (Kontos) 24 hr. REI Group 23	Aphids, leafhoppers, mealybugs, spider mites (suppression), whiteflies	Vegetable transplants (see label for specific types)	Systemic insecticide.
Sucrose Octanoate Esters (SucraShield) 48 hr. REI NC Organic product	Aphids, caterpillars, leafhoppers, mites, thrips, whiteflies	Many vegetables (see label for specific types)	Contact insecticide with limited residual activity. Thorough coverage of all plant parts is needed. Sucrose octanoate esters are produced in the hairs of tobacco leaves.

Thiamethoxam (Flagship 25 WG) 12 hr. REI Group 4A	Fruiting vegetables: aphids, flea beetles, leafhoppers, whiteflies, stink bugs Cucurbit vegetables: aphids, flea beetles, cucumber beetles (suppression), leafminers (suppression), whiteflies	Foliar application to vegetable plants grown for resale to consumers See label for specific types of fruiting and cucurbit vegetables	Systemic insecticide.
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This information is supplied with the understanding that no discrimination is intended and no endorsement implied. Due to constantly changing regulations, we assume no liability for suggestions. If any information in these tables is inconsistent with the label, follow the label. Always follow label instructions regarding registered uses and note cautions. To avoid any phytotoxicity problems, spot test first before widespread use.

Resistance Groups (number and letter) indicate products with a common mode of action based on the Insecticide Resistance Action Committee (IRAC) guidelines at <http://www.irc-online.org/> . For multiple applications to one crop, select products from different resistant groups.
NC = Not Classified

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