



This is a section from the

2018

Mid-Atlantic

Commercial Vegetable

Production Recommendations

The manual, which is published annually, is **NOT** for home gardener use.

The **full manual**, containing recommendations specific to New Jersey, can be found on the Rutgers NJAES website in the Publications section:

<http://njaes.rutgers.edu/pubs/publication.asp?pid=E001>.

The **label** is a legally-binding contract between the user and the manufacturer. The user must follow all rates and restrictions as per label directions. The use of any pesticide inconsistent with the label directions is a violation of Federal law.

Cooperating Agencies: Rutgers, The State University of New Jersey, U.S. Department of Agriculture, and County Boards of Chosen Freeholders. Rutgers Cooperative Extension, a unit of the Rutgers New Jersey Agricultural Experiment Station, is an equal opportunity program provider and employer.

F. Commodity Recommendations

Pesticide Use Disclaimer

THE LABEL IS THE LAW

Before using a pesticide, check the label for up to date rates and restrictions.

Labels can be downloaded from: <http://www.cdms.net/>, <http://www.greenbook.net/> or <http://www.agrian.com/labelcenter/results.cfm>

Guide to the Recommended Pesticide Tables in the Following Crop Chapters:

1. Pesticides are listed by **group or code number based on chemical structure and mode of action**, as classified by the Weed Science Society of America (WSSA) for herbicides, the Insecticide Resistance Action Committee (IRAC) for insecticides, and the Fungicide Resistance Action Committee (FRAC) for fungicides.
If the number is in bold font, the product may have resistance concerns.
2. For **restricted use pesticides**, the restricted active ingredients are labeled with a *. See the Pesticide Safety chapter for more information.
3. **In addition to the pesticides listed below, other formulations or brands with the same active ingredient(s) may be available. ALWAYS CHECK THE LABEL:**
 - a) to ensure a pesticide is labeled for the same use,
 - b) to ensure the pesticide is labeled for the desired crop, and
 - c) for additional restrictions.
4. All pesticide recommendations are made for spraying a **broadcast area of 1 acre** (43,560 square feet). **Adjust the rate for banded applications** (for more information, see the Pest Management chapter, Calibrating Granular Applicators section).
5. Check the label for the maximum amount of pesticide per application and the maximum number of applications per year.
6. **Bee Toxicity Rating (Bee TR):** N=nontoxic; L=minimum impact on bees; M=moderately toxic, can be used if dosage, timing and method of application are correct, but should NOT be applied directly to crop if bees are present; H=highly toxic, severe losses expected, -- = data not available.

Eggplant

Recommended Varieties^{1,2}

	Variety	Days ³	F1 ⁴	Color	Calyx Color	Shape	Type	TMV ⁵
Standard Market Type	Clara	65	Yes	White	Green	Teardrop		
	Epic	64	Yes	Purple/black	Green	Oval		X
	Nadia	70	Yes	Black	Green	Oval Long		X
	Night Shadow	68-75	Yes	Black	Green	Teardrop		
	Santana	80	Yes	Black/Purple	Green	Elongated Oval		
	White Lightning	75	Yes	White	Green	Teardrop		
	White Star	55	Yes	White	Green	Teardrop		
Specialty Types	Barbarella	65	Yes	Purple	Purple	Round	Sicilian	
	Calliope	64	Yes	Purple variegated	Green	Oval	Asian	
	Fairy Tale	65	Yes	Purple variegated	Green	Mini Slender	Japanese	
	Gretel	55	Yes	White	Green	Mini Slender	Japanese	
	Hansel	55	Yes	Purple	Green	Mini Slender	Japanese	
	Kermit	60	Yes	Green and White	Green	Mini Round	Thai	
	Machiaw	65	Yes	Violet	Green	Slender Long	Asian	
	Megal	60	Yes	Purple/Black	Green	Elongated Oval	Italian	X
	Millionaire	55	Yes	Black	Purple	Slender	Japanese	
	Nubia	68	Yes	Purple Variegated	Green	Oval Elongated	Italian	
	Orient Charm	65	Yes	Violet	Green	Slender Long	Asian	
	Orient Express	58	Yes	Purple	Purple	Slender Long	Asian	
	Palermo	70	Yes	Purple	Purple	Round	Sicilian	
	Purple Fingers	65	No	Purple	Green	Mini Slender	Italian	
	Purple Shine	70	Yes	Purple	Purple	Slender Long	Chinese	
	Sabelle	65	Yes	Purple	Purple	Oval/Round	Sicilian	
Shoya Long	55-60	Yes	Purple	Purple	Slender Long	Japanese		
Shooting Stars	57	No	Purple variegated	Green	Elongated Oval			

¹Varieties are listed alphabetically. ²Variety y attributes based on Seed Company information.

³Days from transplanting till harvest ⁴Hybrid (yes/no).

⁵TMV=Tobacco Mosaic Virus. Only those varieties with some resistance or tolerance to TMV are noted with an X.

Recommended Nutrients Based on Soil Tests

In addition to using the table below, check the suggestions on rate, timing, and placement of nutrients in your soil test report and the Soil and Nutrient Management chapter. Your state's soil test report recommendations and/or your farm's nutrient management plan supersede recommendations found below.

Eggplant ¹		Soil Phosphorus Level				Soil Potassium Level				Nutrient Timing and Method
		Low	Med	High (Opt)	Very High	Low	Med	High (Opt)	Very High	
		P ₂ O ₅ (lb/A)				K ₂ O (lb/A)				
	125-150 ²	250	150	100	0	250	150	100	0	Total nutrient recommended
	50-100	250	150	100	0	250	150	100	0	Broadcast and disk-in
	25-50	0	0	0	0	0	0	0	0	Sidedress 3-4 weeks after planting
	25-50	0	0	0	0	0	0	0	0	Sidedress 6-8 weeks after planting

¹For plasticulture, fertilization rates are based on a standard row spacing of 6 ft. Apply 1-2 lb/A of boron (B) with broadcast fertilizer; see also Table B-7 in the Soil and Nutrient Management chapter.

²If crop is to be mulched with plastic but not drip/trickle fertilized, broadcast 225 lb/A N with recommended P₂O₅ and K₂O and disk-in or incorporate prior to laying mulch.

Plant Tissue Testing

Plant tissue testing can be a valuable tool to assess crop nutrient status during the growing season to aid with in-season fertility programs or to evaluate potential deficiencies or toxicities.

Plant Tissue Testing - continued

Critical Eggplant Tissue Test Values For Most Recently Matured Leaves													
Timing	Value	N	P	K	Ca	Mg	S	Fe	Mn	Zn	B	Cu	Mo
		%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm
Early Fruit Set	Deficient	<4.2	0.3	3.5	0.8	0.25	0.4	<50	50	20	20	5	0.5
	Adequate range	4.2	0.3	3.5	0.8	0.25	0.4	50	50	20	20	5	0.5
		6	0.6	5	1.5	0.6	0.6	100	100	40	40	10	0.8
	High	>6.0	0.6	5	1.5	0.6	0.6	>100	100	40	40	10	0.8
	Toxic (>)	-	-	-	-	-	-	-	-	-	-	-	-

Seed Treatment Use hot water seed treatment - see Seed Treatment in the Pest Management chapter.

Transplant Production and Transplanting Dates

Sow seed in the greenhouse 8-10 weeks before field planting. Three to four ounces of seed are necessary to produce plants for 1 acre. Optimum temperatures for germination and growth are 70-75°F (21-24°C). Seedlings should be transplanted to 2-inch or larger pots any time after the first true leaves appear, or seed can be sown directly into the pots and thinned to a single plant per pot.

Harden plants for a few days at 60-65°F (16-18°C) and set in field after danger of frost when average daily temperatures have reached 65-70°F (18-21°C). Usual transplanting period is May 15 to June 5. Eggplant is a warm-season crop that grows best at temperatures between 70-85°F (21-29°C). Temperatures below 65°F (18°C) result in poor growth and fruit set.

Spacing Rows: 4-5 feet apart; plants: 2-3 feet apart in the row. Space plants 18-30 inches apart in PA.

Drip/Trickle Fertilization

Before mulching, adjust soil pH to around 6.5 and then apply enough farm-grade fertilizer to supply 60 lb/A of N, P₂O₅ and K₂O. Thoroughly incorporate fertilizer into the soil. If soil tests medium or less in soil K, apply a fertilizer with a ratio of 1-1-2 or 1-1-3 carrying 60 lb/A of N. After mulching and installing the drip irrigation system, apply completely soluble fertilizers to supply 40 lb/A (10-20 lb/A in PA) of N, P₂O₅ and K₂O during each application. On soils testing low and low to medium in B and that have not received any preplant B fertilizer, include 0.25 lb/A of actual B in each soluble fertilizer application. The first soluble fertilizer application should be applied through the trickle irrigation system within 1 week after field transplanting. The same rate of soluble fertilizer should be applied about every 3 weeks during the growing season for a total of 6-7 applications.

Mulching and Fumigation

The use of black plastic mulch can increase eggplant yield and promote earliness. Various widths of plastic are available depending on production system and available equipment. At least 50% of the N should be in nitrate form (NO₃⁻¹) when planting in fumigated soil under plastic mulch. For more details, see the Weed Control section below.

Staking

High intensity eggplant production can benefit from staking, but the heavy fruit load results in a high cost for staking materials. Use a staking system similar to that described for tomatoes. Pruning is not required for eggplant, but removing the two lowest branches helps with plastic removal at seasons end if the plants are mowed off.

Harvest and Post Harvest Considerations

Fruit should be harvested when the skin is still a glossy color and the seed and pulp are white. Soft fruit and dark seed indicate over maturity. Mature fruit must be harvested to ensure continued fruit set. Harvested fruit should be moved to a protected area as soon as possible. If left in direct sunlight the fruit will sunburn. Cool eggplants in a cold room, forced-air or forced-air and evaporative cooling. Fruit are sensitive to temperatures below 50°F (10°C) (see fruit disorders below), but can be stored for 1-2 weeks at 50-54°F (10-12°C) and 90-95% relative humidity.

Fruit Disorders

Liver Spot and Pitting: ‘Liver spot’ and ‘pitting’ are late season physiological disorders that become apparent on the fruit surface post-harvest. Light-tan to coppery colored spots and scratching may appear after washing; scratching is most likely caused by rough handling or contact of fruit with the ground. Pitting (small slightly sunken brown pits) may also occur. Liver spot and/or pitting are thought to be caused by a thinner waxy fruit cuticle as a result of cooler temperatures. Temperatures at or below 50°F (10°C) are often associated with both disorders.

Internal Seed Cavity Browning: Symptoms of internal seed cavity browning include the discoloration or browning of the fruit tissue directly surrounding the seed cavity. The discoloration can be caused by low temperatures and/or bruising and compression injury during harvest and postharvest handling.

Weed Control

THE LABEL IS THE LAW - See the Pesticide Use Disclaimer on page F 1.

Recommended Herbicides

1. Identify the weeds in each field and select recommended herbicides. More information is available in the “Herbicide Effectiveness on Common Weeds in Vegetables” Table (E-2) in the Pest Management chapter.
2. Minimize herbicide resistance development. Identify the herbicide site mode of action group and follow recommended good management practices. Include non-chemical weed control whenever possible.

Labeled Applications Sites for Eggplant									
Herbicides	WSSA group number	Plastic mulch production					Bare-ground production		
		Soil-Applied		Postemergence			Soil-applied	POST	Post-harvest
		Under Plastic	Row Middles	Over Plastic	Row Middles	Post-Harvest			
Sandea	2		YES		YES		directed*		
Dacthal	3							YES**	
Prowl H20	3		YES				YES		
Devrinol	15	YES	YES				YES		
Poast	1			YES				YES	
Select	1			YES				YES	
SelectMax	1			YES				YES	
Gramoxone	22				YES	YES			YES

*Sandea is labeled for bareground only if the spray is directed to the row middles.

**Dacthal is labeled for over the top application, but will it will not control emerged weeds.

1. Soil-Applied						
Group	Product Name	Product Rate	Active Ingredient (*=Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
2	Sandea 75DF	0.5 to 1.0 oz/A	halosulfuron	0.023 to 0.047 lb/A	30	12
<p>-Plasticulture: row middles only; adjust equipment to keep the spray off the plastic.</p> <p>-Bareground: apply between rows of direct-seeded or transplants; DO NOT apply as broadcast application; avoid contact of the herbicide with the planted crop</p> <p>-Suppresses or controls yellow nutsedge and certain broadleaf weeds. Sandea provides both residual and postemergence control of susceptible weed species. Effective postemergence control requires an adjuvant.</p> <p>-Sandea is an ALS inhibiting herbicide and resistant weed populations are common in the region. Do not use Group 2 herbicides repeatedly in the same field. Do not apply Sandea to crops treated with a soil applied organophosphate insecticide, or use a foliar applied organophosphate insecticide within 21 days before or 7 days after a Sandea application.</p> <p>-Maximum number of Sandea applications per year is 2 and do not exceed 2 oz/A during the crop season.</p>						
3	Dacthal 6F Dacthal W-75	8.0 to 14.0 pt/A 6.0 to 14 lb/A	DCPA	6.0 to 10.5 lb/A	--	12
<p>-Labeled for applications over the top of transplants without injury (will not control emerged weeds); transplants should be well-established and growing conditions favorable for good plant growth. Label recommends 4 to 6 weeks after transplanting or direct-seeded plants at 4 to 6 inches in height. Post-transplant applications can only be made with bare-ground production.</p> <p>-Dacthal will not control emerged weeds; apply to weed-free soils. Primarily controls annual grasses and a few broadleaf weeds, including common purslane. Results have been most consistent when used in fields with coarse -textured soils low in organic matter, and when the application are followed by rainfall or irrigation. Maximum application not addressed on label.</p>						

1. Soil-Applied continued on next page

1. Soil-Applied - continued.

3	Prowl H2O 3.8CS	1.0 to 3.0 pt/A	pendimethalin	0.48 to 1.42 lb/A	70	24
<p>-Plasticulture: recommended for row middles only. Labeled for under plastic, but no local data or experience with this application.</p> <p>-Bareground: broadcast preplant or preplant incorporated before transplanting; not labeled for direct-seeded crop.</p> <p>-Avoid root contact with Prowl-treated soil when placing transplants into furrow or hole or injury may occur.</p> <p>-Prowl labeled for directed application to transplanted or established direct-seeded eggplant; avoid contact with leaves or stems.</p> <p>-Prowl will not control emerged weeds, only provides residual control; row middle applications may be made with Gramoxone using shielded sprayers. Use the lower rate on coarse-textured or sandy soils. Activate with ½ inch of rainfall or sprinkler irrigation within 48 hr of application to control most annual grasses and certain broadleaf weeds.</p> <p>-Maximum Prowl H2O application per season: 3 pt/A.</p>						
15	Devrinol 2-XT	2 to 4 qt/A	napropamide	1.0-2.0 lb/A	--	24
<p>-Plasticulture: labeled for under plastic mulch; apply in a band under the plastic, immediately before laying mulch. Condensation that forms on the underside of the mulch will activate the herbicide. Plasticulture: row middles application is labeled.</p> <p>-Bareground: apply as broadcast, preemergence treatment for transplanted eggplant.</p> <p>-Annual grasses and certain annual broadleaf weeds will be suppressed or controlled. May reduce stand and yield of fall planted small grain crop. Moldboard plowing will reduce the risk of injury. Maximum Devrinol 2-XT application per season: 4 qt/A.</p>						

2. Postemergence

Group	Product Name	Product Rate	Active Ingredient (* = Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
1	Select 2EC	6 to 8 fl oz/A	clethodim	0.07 to 0.12 lb/A	1	24
	Select Max 0.97EC	9 to 16 fl oz/A				
	Poast 1.5EC	1 to 2.5 pt/A	sethoxydim	0.2 to 0.5 lb/A	1	12
<p>-Select 2EC: use crop oil concentrate (COC) at 1% v/v (1 gal/100 gal of spray solution). Select Max: use nonionic surfactant (NIS) at 0.25% v/v (1 qt/100 gal of spray solution). Poast: Apply with COC at 1.0% v/v. The use of COC may increase the risk of crop injury when hot or humid conditions prevail. To reduce the risk of crop injury, omit additives or switch to nonionic surfactant when grasses are small and soil moisture is adequate.</p> <p>-Use lower labeled rates for annual grass control and higher labeled rates for perennial grass control.</p> <p>-Safe for broadcast (over the top) applications with both plasticulture and bareground production.</p> <p>-Yellow nutsedge, wild onion, wild garlic, and broadleaf weeds will not be controlled. Controls many annual and certain perennial grasses, including annual bluegrass, but Select will not consistently control goosegrass. Control may be reduced if grasses are large or if the weather is hot or dry. If repeat applications are necessary, allow 14 d between applications.</p> <p>-Do not tank-mix with or apply within 2 to 3 days of any other pesticide - unless labeled - as this may increase the risk of crop injury or reduce the control of grasses. Rainfastness is 1 hr.</p> <p>-Do not apply more than 8 fl oz of Select 2EC in a single application and do not exceed 2 pt/A for the season; do not apply more than 16 fl oz of Select Max in a single application and do not exceed 4 pt/A for the season.</p> <p>-Do not apply more than 1.5 pt/A Poast 1.5EC in single application and do not exceed 4.5 pt/A for the season.</p>						
3	Dacthal 6F Dacthal W-75	8.0 to 14.0 pt/A 6.0 to 14 lb/A	DCPA	6.0 to 10.5 lb/A	--	12
<p>-Labeled for applications over the top of transplants. Dacthal will not control emerged weeds; apply to weed-free soils.</p> <p>-See comments under soil applied section</p>						
22	Gramoxone 2SL	2.4 pt/A	paraquat*	0.6 lb/A	--	24
<p>-Gramoxone can be applied before or after transplanting to control emerged broadleaf weeds and grass seedlings.</p> <p>-Include a nonionic surfactant at 0.25% v/v. Do not allow spray to contact crop foliage as injury may result. Use flaps that drag along the edge of plastic mulch and use low spray pressure (maximum of 30 psi) to reduce small droplets that are prone to drift.</p> <p>-See the label for additional information and warnings. Rainfastness is 30 minutes. A maximum of 3 applications per year are allowed.</p>						

3. Postharvest

Group	Product Name	Product Rate	Active Ingredient (* = Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
22	Gramoxone 2SL	2.25 to 3 pt/A	paraquat*	0.56 to 0.75 lb/A	--	24
<p>-A Special Local-Needs 24© label has been approved for the use of Gramoxone SL 2.0 until December 31, 2017, for postharvest desiccation of the crop in DE, NJ and VA. Apply after the last harvest for bareground or plasticulture. Always include an adjuvant.</p> <p>-Spray coverage is essential for optimum effectiveness. See the label for additional information and warnings.</p> <p>-Rainfastness 30 minutes. A maximum of 2 applications for crop desiccation are allowed.</p>						

4. Other Labeled Herbicides These products are labeled but limited local data are available; and/or are labeled but not recommended in our region due to potential crop injury concerns.

Group	Product Name	Active Ingredient (* = Restricted Use)
9	Roundup (various)	glyphosate
14	Aim	carfentrazone

Insect Control

THE LABEL IS THE LAW - See the Pesticide Use Disclaimer on page F 1.

Recommended Insecticides

Aphids

Green peach aphids (GPA) are the most common aphids on eggplant. Winged females can produce numerous live pale, yellow or pink-colored young (nymphs). Tremendous numbers can build up on the undersides of leaves often following pyrethroid insecticide applications. Aphids are sucking insects. They excrete a sugary, sticky substance (“honeydew”) that can cause growth of black sooty mold fungus. Both honeydew and mold on fruit can hurt its marketability. Predators and parasitoids (braconid wasps) often can keep aphid populations below damaging levels. Broad spectrum insecticides, like pyrethroids, destroy these natural enemies. Use selective insecticides whenever possible. Sample plants for aphids as well as the presence of natural enemy species. Spray only when aphid densities appear to be increasing in the absence of predators.

Apply one of the following formulations (note: spray coverage to the underside of the leaf is important):						
Group	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
1A	Lannate LV (GPA only)	0.75 to 3.0 pt/A	methomyl*	3	48	H
1A	Vydate L	2.0 to 4.0 pt/A	oxamyl*	7	48	H
1B	Malathion 57EC	1.5 pt/A	malathion	3	12	H
3A + 4A	Brigadier	3.80 to 9.85 fl oz/A	bifenthrin* + imidacloprid	7	12	H
3A + 4A	Leverage 360	3.8 to 4.1 fl oz/A	imidacloprid + beta-cyfluthrin*	7	12	H
4A	Actara 25WDG	2.0 to 3.0 oz/A	thiamethoxam - foliar	0	12	H
4A	Admire Pro	7.0 to 10.5 fl oz/A	imidacloprid - soil	21	12	H
4A	Admire Pro	1.3 to 2.2 fl oz/A	imidacloprid - foliar	0	12	H
4A	Assail 30SG	2.0 to 4.0 oz/A	acetamiprid	7	12	M
4A	Belay 2.13SC	9.0 to 12.0 fl oz/A	chlorothianidin - soil	21	12	H
4A	Belay 2.13SC	3.0 to 4.0 fl oz/A	chlorothianidin - foliar	1	12	H
4A	Platinum 75SG	1.66 to 3.67oz/A	thiamethoxam - foliar	30	12	H
4A + 28	Durivo	10.0 to 13.0 fl oz/A	thiamethoxam + chlorantraniliprole - soil	30	12	H
4A + 28	Voliam Flexi	4.0 to 7.0 fl oz/A	thiamethoxam + chlorantraniliprole - foliar	1	12	H
4C	Closer SC	1.5 to 2.0 fl oz/A	sulfoxaflor	1	12	H
4D	Sivanto 200SL	21.0 to 28.0 fl oz/A	flupyradifurone - soil	45	4	L
4D	Sivanto Prime	7.0 to 14.0 fl oz/A	flupyradifurone - foliar	1	4	L
9B	Fullfill 50WDG	2.75 oz/A	pymetrozine	0	12	L
9C	Beleaf 50SG	2.0 to 2.8 oz/A	flonicamid	0	12	L
23	Movento	4.0 to 5.0 fl oz/A	spirotetramat	1	24	L
28 + 6	Minecto Pro	10.0 fl oz/A	cyantraniliprole + abamectin*	7	12	H
n/a	Requiem EC (OMRI)	2.0 to 3.0 qt/A	<i>Chenopodium</i> extract (biopesticide)	0	4	L

Colorado Potato Beetles (CPB)

CPB has the ability to rapidly develop resistance to insecticides (see also “Insect Resistance and Control” in the Pest Management chapter, Insect Management section). The use of the egg parasitoid, *Edovum puttleri*, has been shown to control CPB effectively in eggplant, or apply one of the following insecticides.

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
1A	Vydate L	2.0 to 4.0 pt/A	oxamyl*	7	48	H
3A + 4A	Brigadier	5.10 to 9.85 fl oz/A	bifenthrin* + imidacloprid	7	12	H
3A + 4A	Leverage 360	3.8 to 4.1 fl oz/A	imidacloprid + beta-cyfluthrin*	0	12	H
3A + 4A	Swagger	10.2 to 19.7 fl oz/A	bifenthrin* + imidacloprid	7	12	H
4A	Admire Pro	7.0 to 10.5 fl oz/A	imidacloprid - soil	21	12	H
4A	Admire Pro	1.3 to 2.2 fl oz/A	imidacloprid - foliar	0	12	H
4A	Assail 30SG	1.5 to 2.5 oz/A	acetamiprid	7	12	M
4A	Platinum 75SG	1.66 to 3.67 oz/A	thiamethoxam - soil	30	12	H
4A	Actara 25WDG	2.0 to 3.0 oz/A	thiamethoxam - foliar	0	12	H

Colorado Potato Beetle continued on next page

Colorado Potato Beetle - continued

4A	Scorpion 35SL	9.0 to 10.5 fl oz/A	dinotefuran - soil	21	12	H
4A	Scorpion 35SL	2.0 to 7.0 fl oz/A	dinotefuran - foliar	1	12	H
4A	Venom 70SG	5.0 to 7.5 oz/A	dinotefuran - soil	21	12	H
4A	Venom 70SG	1.0 to 4.0 oz/A	dinotefuran - foliar	1	12	H
4A + 28	Durivo	10.0 to 13.0 fl oz/A	thiamethoxam + chlorantraniliprole	30	12	H
4A + 28	Voliam Flexi	4.0 to 7.0 fl oz/A	thiamethoxam + chlorantraniliprole	1	12	H
4D	Sivanto 200SL	10.5 to 14.0 fl oz/A	flupyradifurone - foliar	1	4	L
5	Entrust SC (OMRI)	3.0 to 6.0 fl oz/A	spinosad	1	4	M
5	Radiant SC	5.0 to 10.0 fl oz/A	spinetoram	1	4	H
6	Agri-Mek 0.7SC	1.75 to 3.5 fl oz/A	abamectin*	7	12	H
11	Trident ¹ (OMRI)	3 to 6 qt/A	<i>Bacillus thuringiensis tenebrionis</i> ¹	0	0	L
15	Rimon 0.83EC	9.0 to 12.0 fl oz/A	novaluron	1	12	L
28	Coragen 1.67SC	3.5 to 5.0 fl oz/A	chorantraniliprole- drip, foliar	1	4	L
28	Exirel	7.0 to 13.5 fl oz/A	cyantraniliprole - foliar	1	12	H
28	Verimark	5.0 to 10.0 fl oz/A	cyantraniliprole - soil	1	4	H
28 + 6	Minecto Pro	5.5 to 10.0 fl oz/A	cyantraniliprole + abamectin*	7	12	H

¹Small Larvae only, NOT effective against medium larvae and adults. Larval reduction may not be noticeable for 48-72 h. Apply when eggs begin to hatch and repeat at 5-7-day intervals. If rainfall occurs within 24 h post-treatment, reapplication may be necessary.

Eggplant Lacebugs

Eggplant lacebug is a sporadic pest. It is a small sucking insect with lacy wings and conspicuous veins. Damage consists of stippling and yellowing/whitening of the leaves. Good insecticide coverage is essential.

Apply the following formulation: (Note: Infestations are reduced by the use of dinotefuran, emamectin benzoate, oxamyl, permethrin and lambda-cyhalothrin+chlorantraniliprole).						
Group	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
1B	Malathion 57EC	2.5 pt/A	malathion	3	12	H

Flea Beetles

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
3A + 4A	Brigadier	5.1 to 9.85 fl oz/A	bifenthrin* + imidacloprid	7	12	H
3A + 4A	Leverage 360	4.1 fl oz/A	imidacloprid + beta-cyfluthrin*	7	12	H
3A + 4A	Swagger	7.6 to 19.6 fl oz/A	bifenthrin* + imidacloprid	7	12	H
3A + 28	Voliam Xpress	6.0 to 9.0 fl oz/A	lambda-cyhalothrin* + chlorantraniliprole	5	24	H
3A	Asana XL	5.8 to 9.6 fl oz/A	esfenvalerate*	7	12	H
3A	Baythroid XL	2.8 fl oz/A	beta-cyfluthrin*	7	12	H
3A	Bifenture EC	2.1 to 6.4 fl oz/A	bifenthrin*	7	12	H
3A	Hero EC	4.0 to 10.3 fl oz/A	zeta-cypermethrin* + bifenthrin*	7	12	H
3A	Lambda-cy, LambdaT	1.28 to 1.92 fl oz/A	lambda-cyhalothrin*	5	24	H
3A	Mustang Maxx	2.24 to 4.0 fl oz/A	zeta-cypermethrin*	1	12	H
3A	Permethrin 3.2, Perm-up 3.2	4.0 to 8.0 fl oz/A	permethrin*	3	12	H
3A	Proaxis	2.56 to 3.84 fl oz/A	gamma-cyhalothrin*	5	24	H
3A	Tombstone, Tombstone Helios	2.8 fl oz/A	cyfluthrin*	7	12	H
3A	Warrior II	1.28 to 1.92 fl oz/A	lambda-cyhalothrin*	5	24	H
3A + 4A	Endigo ZC	4.0 to 4.5 fl oz/A	lambda-cyhalothrin* + thiamethoxam	5	24	H
4A	Admire Pro	7.0 to 10.5 fl oz/A	imidacloprid- soil	21	12	H
4A	Platinum 75SG	1.66 to 3.67 oz/A	thiamethoxam - soil	30	12	H
4A	Actara 25WDG	2.0 to 3.0 oz/A	thiamethoxam- foliar	0	12	H
4A	Scorpion 35SL	9.0 to 10.5 fl oz/A	dinotefuran - soil	21	12	H
4A	Scorpion 35SL	2.0 to 7.0 fl oz/A	dinotefuran - foliar	1	12	H
4A	Venom 70SG	5.0 to 7.5 oz/A	dinotefuran - soil	21	12	H
4A	Venom 70SG	1.0 to 4.0 oz/A	dinotefuran - foliar	1	12	H
4A + 28	Durivo	10.0 to 13.0 fl oz/A	thiamethoxam + chlorantraniliprole - soil	30	12	H
4A + 28	Voliam Flexi	4.0 to 7.0 fl oz/A	thiamethoxam + chlorantraniliprole - foliar	1	12	H
28	Verimark	6.75 to 13.5 fl oz/A	cyantraniliprole - soil	1	4	H

F Eggplant

Leafminers

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
1A	Vydate L	2.0 to 4.0 pt/A	oxamyl*	7	48	H
3A + 4A	Brigadier (adults only)	5.1 to 9.85 fl oz/A	bifenthrin* + imidacloprid	7	12	H
3A + 4A	Swagger (adults only)	10.2 to 19.7 fl oz/A	bifenthrin* + imidacloprid	7	12	H
3A	Perm-up 3.2, Permethrin 3.2	4.0 to 8.0 fl oz/A	permethrin*	3	12	H
4A	Scorpion 35SL	9.0 to 10.5 fl oz/A	dinotefuran - soil	21	12	H
4A	Scorpion 35SL	2.0 to 7.0 fl oz/A	dinotefuran - foliar	1	12	H
4A	Venom 70SG	5.0 to 7.5 oz/A	dinotefuran - soil	21	12	H
4A	Venom 70SG	1.0 to 4.0 oz/A	dinotefuran - foliar	1	12	H
4A + 28	Durivo	10.0 to 13.0 fl oz/A	thiamethoxam + chlorantraniliprole - soil	30	12	H
5	Entrust SC (OMRI)	6.0 to 10.0 fl oz/A	spinosad	1	4	M
5	Radiant SC	6.0 to 10.0 fl oz/A	spinetoram	1	4	H
6	Agri-Mek 0.7SC	1.75 to 3.5 fl oz/A	abamectin*	7	12	H
6	Proclaim 5SG	3.2 to 4.8 oz/A	emamectin benzoate	7	12	H
16B	Rimon 0.83EC	12 fl oz/A	novaluron	1	12	L
28	Verimark	6.75 to 10.0 fl oz/A	cyantraniliprole - soil	1	4	H
28	Exirel	13.5 to 20.5 fl oz/A	cyantraniliprole - foliar	1	12	H
28 + 6	Minecto Pro	5.5 to 10.0 fl oz/A	cyantraniliprole + abamectin*	7	12	H

Mites

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
6	Agri-Mek 0.7SC	1.75 to 3.5 fl oz/A	abamectin*	7	12	H
10B	Zeal miticide	2.0 to 3.0 oz/A	etoxazole	7	12	L
12B	Vendex 50WP	2.0 to 3.0 lb/A	fenbutatin-oxide*	3	48	H
21A	Portal/Portal XLO	2.0 pt / A	fenpyroximate	1	12	L
23	Oberon 2SC	7.0 to 8.5 fl oz/A	spiromesifen	1	12	M
25	Acramite 50WS	0.75 to 1.00 lb/A	bifenazate	3	12	L
28 + 6	Minecto Pro	5.5 to 10.0 fl oz/A	cyantraniliprole + abamectin*	7	12	H

Thrips

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
3A + 4A	Brigadier	5.1 to 9.85 fl oz/A	bifenthrin* + imidacloprid	7	12	H
3A + 4A	Endigo ZC	4.5 fl oz/A	lambda-cyhalothrin* + thiamethoxam	5	24	H
3A + 4A	Leverage 360 (foliage feeding thrips only)	3.8 to 4.1 fl oz/A	imidacloprid + beta-cyfluthrin	7	12	H
3A + 4A	Swagger	7.6 to 19.7 fl oz/A	bifenthrin* + imidacloprid	7	12	H
3A ¹	Baythroid XL ¹	2.1 to 2.8 fl oz/A	beta-cyfluthrin*	7	12	H
3A ¹	Hero EC ¹	10.3 fl oz/A	zeta-cypermethrin*+bifenthrin*	3	12	H
3A ¹	Lambda-Cy, LambdaT ¹	2.56 to 3.84 fl oz/A	lambda-cyhalothrin*	5	24	H
3A ¹	Tombstone, Tombstone Helios ¹	2.1 to 2.8 fl oz/A	cyfluthrin*	7	12	H
3A ¹	Warrior II ¹	1.28 to 1.92 fl oz/A	lambda-cyhalothrin*	5	24	H
4A	Admire Pro (foliage feeding thrips only)	7.0 to 10.5 fl oz/A	imidacloprid - soil	21	12	H
4A	Scorpion 35SL	9.0 to 10.5 fl oz/A	dinotefuran - soil	21	12	H
4A	Scorpion 35SL	9.0 to 10.5 fl oz/A	dinotefuran - foliar	1	12	H
4A	Platinum 75SG	1.66 to 3.67 fl oz/A	thiamethoxam - soil	30	12	H
4A	Venom 70SG	5.0 to 7.5 oz/A	dinotefuran - soil	21	12	H
4A	Venom 70SG	1.0 to 4.0 oz/A	dinotefuran - foliar	1	12	H
5	Entrust SC (OMRI)	6.0 to 10.0 fl oz/A	spinosad	1	4	M
5	Radiant SC	6.0 to 10.0 fl oz/A	spinetoram	1	4	H

¹Resistance concerns with Western flower thrips only.

Disease Control

THE LABEL IS THE LAW - See the Pesticide Use Disclaimer on page F 1.

Recommended Pesticides

Nematodes

See the Soil Fumigation and Nematodes sections in the Pest Management chapter.

Seed Treatment

Use hot water seed treatment - see Seed Treatment in the Pest Management chapter (section Disease Management).

Damping-Off caused by *Phytophthora*, *Pythium*, and *Rhizoctonia*

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
Apply one of the following at-planting (see label for application methods and restrictions):						
Phytophthora and Pythium root rot¹						
4	Ridomil Gold 4SL	0.5 to 1.0 pt/A	mefenoxam	5	48	N
4	Ultra Flourish 2E	2.0 to 4.0 pt/A	mefenoxam	5	48	N
4	MetaStar 2E	4.0 to 8.0 pt/A	metalaxyl	AP	48	N
Phytophthora, Pythium, and Rhizoctonia root rot						
4 + 11	Uniform 3.66SE	0.34 fl oz/1000 ft row. Avoid direct seed contact, which may cause delayed emergence.	mefenoxam + azoxystrobin	AP	0	N
Rhizoctonia root rot²						
11	azoxystrobin 2.08F	0.40 to 0.80 fl oz/1000 ft row	azoxystrobin	AP	4	N

¹Also see Phytophthora blight - root and crown rot below.

² Rhizoctonia can become a problem in transplants that have been in transplant trays for too long prior to transplanting, or in transplants shortly after planting where the root zone is allowed to become excessively dry. To help suppress Rhizoctonia root rot apply the following via drip at transplanting.

Phytophthora Blight (*Phytophthora capsici*) - Root and Crown Rot

To minimize the occurrence of Phytophthora blight rotate fields away from susceptible crops (such as cucurbits, peppers, eggplants, and tomatoes) for as many years as possible. Avoid using mefenoxam if insensitivity is known to exist. Sensitivity to mefenoxam can return if it has not been used in recent years.

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
Apply one of the following formulations via drip application at transplanting and 30 days later:						
4	Ridomil Gold 4SL	1.0 pt/A	mefenoxam	7	12	N
4	Ultra Flourish 2E	1.0 qt/A	mefenoxam	7	12	N
U15 + 4	Orondis Gold 1.67SC ¹	1.0 pt/A	oxathiapiprolin + mefenoxam	0	4	--
If conditions favor disease development, apply the following drip application 14 d after at-transplanting applications:						
43	Presidio 4SC	3.0 to 4.0 fl oz/A	fluopicolide	2	12	L

¹If Orondis Gold is applied via drip application it cannot be applied as a foliar spray. See label for restrictions.

Phytophthora Blight (*Phytophthora capsici*) - Fruit and Stem Rot

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
For suppression of the aerial stem and fruit rot phase of Phytophthora blight, apply and rotate the following with a fixed copper at labeled rates on a 7 to 10 day schedule or when environmental conditions are conducive for disease development:						
21	Ranman 400SC	2.75 fl oz/A PLUS a non-ionic surfactant (do not apply Ranman with copper)	cyazofamid	0	12	L
40	Forum 4.18SC	6.0 fl oz/A	dimethomorph	0	12	N
43	Presidio 4SC	3.0 to 4.0 fl oz/A	fluopicolide	1	12	L
U15 + 4	Orondis Gold 1.67SC ¹	1.0 pt/A ¹	oxathiapiprolin + mefenoxam	0	4	--

¹If Orondis Gold is applied via a foliar application it cannot be applied via drip system. See label for restrictions.

F Eggplant

Fungal Fruit Rots

Scout regularly and begin preventative sprays when weather conditions favor disease development and repeat every 7-10 days. **Do not** apply FRAC code 11 fungicides more than 4 times in a single year. Tank mix FRAC code 11 fungicides with a protectant fungicide such as fixed copper or chlorothalonil to help reduce resistance development.

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
Tank mix chlorothalonil 1.5 pt 6F/A or fixed copper at labeled rates with one of the following FRAC code 11 fungicides:						
11	azoxystrobin 2.08F	6.0 to 15.5 fl oz/A	azoxystrobin	0	4	N
11 + 3	Quadris Top 2.72SC	8.0 to 14.0 fl oz/A	azoxystrobin + difenoconazole	0	12	--
11 + 7	Priaxor	4.0 to 8.0 fl oz/A	pyraclostrobin + fluxapyroxad	7	12	N
And rotate with one of the following:						
M1	copper (OMRI) ¹	Use labeled rate	copper	0	24	N
M5	chlorothalonil 6F	1.5 pt/A	chlorothalonil	3	12	L

¹There are a number of copper based products with OMRI labels. See labels for specifics. Copper applications may help suppress some fungal pathogens in organic production systems.

Fungal Leaf Spots

Scout on a regular basis and begin preventative sprays when weather conditions favor disease development, or when symptoms of disease first appear, and repeat every 7-10 days. **Do not** apply FRAC code 11 fungicides more than 4 times in a single year. Tank mix FRAC code 11 fungicides with a protectant fungicide such as copper or chlorothalonil to help reduce resistance development.

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
Tank mix chlorothalonil 6F 1.5 pt/A or fixed copper at labeled rates with one of the following FRAC code 11 fungicides:						
11	azoxystrobin 2.08F	6.0 to 15.5 fl oz/A	azoxystrobin	0	4	N
11	Cabrio 20EG	8.0 to 12.0 oz/A (leaf spots only)	pyraclostrobin	0	12	N
11	Fontelis 1.67SC	10.0 to 24.0 fl oz/A	penthiopyrad	7	12	L
11	Quadris Top 2.72SC	8.0 to 14.0 fl oz/A	azoxystrobin + difenoconazole	0	12	--
And rotate with one of the following:						
M1	copper (OMRI) ¹	Use labeled rate	copper	0	24	N
M5	chlorothalonil 6F	1.5 pt/A	chlorothalonil	3	12	L

¹There are a number of copper based products with OMRI labels. See labels for specifics. Copper applications may help suppress some fungal pathogens in organic production systems.

Verticillium Wilt

Best control can be accomplished by using a 4 to 5 year rotation with crops other than tomato, potato, pepper, strawberry, or any of the brambles. Varieties which appear to maintain yield in infested fields include Classic, and Epic. Soil fumigation will provide some control by delaying symptom expression. Use metam-sodium (Vapam HL - see label for specifics and restrictions). Broadcast treatments are superior to row treatments. Refer to the "Soil Fumigation" section in the Pest Management chapter for details on application.

Viruses

Tomato Spotted Wilt Virus

Tomato Spotted Wilt Virus is spread by thrips from flowering ornamental plants to eggplant. Do not grow any ornamental bedding plants in the same greenhouse as eggplant transplants. Monitor and scout greenhouses for thrips and begin an insecticide control program once observed.

For Immediate Medical Attention

Call 911

**For a Pesticide Exposure Poisoning
Emergency Call**



For All States

This number will automatically connect you to the poison center nearest you.

Anyone with a poisoning emergency can call the toll-free telephone number for help. Personnel at the Center will give you first-aid information and direct you to local treatment centers if necessary.

For Pesticide Spills

Small Spills: See the product label for cleanup advice.

Large spills: Call the National Response Center at 1-800-424-8802 or CHEMTREC at 800-424-9300 (24 hours) - Industry assistance with emergency response cleanup procedures for large, dangerous spills.

Be aware of your responsibility to report spills to the proper state agency.