

Chapter 18. Tomato Production¹

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Botany and Planting

Tomato—*Solanum lycopersicum*, Solanaceae

Table 1. Planting information for tomato.

Planting Dates	
North Florida	July–Aug; Feb–Apr
West-central Florida	Aug–Sept; Jan–Feb
South Florida	Aug–Feb
Planting Information	
Distance between rows (in.)	48–72
Distance between plants (in.)	18–32
Days to maturity	70–90
Plant population per acre	3630–4356

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Cultivars

For more information on tomato varieties, see <https://edis.ifas.ufl.edu/publication/HS1189>.

Large-Fruited and Beefsteak Types

BHN 602. Early midseason maturity. Fruit are globe-shaped and green-shouldered.

BHN 3353. Continuous yield of large to extra-large fruit on a strong, determinate plant. Great for multiple picks.

Camaro. Medium plant with limited to no pruning. Extra-large globe-shaped fruit.

Everglade. Full-season maturity with deep oblate fruit. Performs well in cool weather conditions.

Florida 47. A late midseason, determinate, jointed hybrid. Uniformly green, globe-shaped fruit.

Florida 91. Midseason variety. Uniformly green fruit borne on jointed pedicels. Determinate plant. Good fruit-setting ability under high temperatures.

Grand Marshall. Midseason vigorous plant with hot set and extra-large to large oblate fruit.

HM 1823. Determinate, round tomato, early-maturing variety with a strong plant and large to extra-large round fruit.

Jolene. Early maturing, determinate variety producing large to extra-large fruit with deep, dark interiors. Suitable for mature green or vine-ripe production.

Loretta. Determinate, high-flavor variety for fresh market or gas green production. Fruits have deep, round shape and pinpoint blossom end.

Red Bounty. Medium maturity, good heat set, extra-large globe fruit.

Red Defender. Medium maturity. Vigorous vine with smooth, large, deep-red fruit with excellent firmness and shelf life.

Red Snapper. Determinate, round variety suited for mature green and vine-ripe markets. Versatile across seasons with good hot-set potential.

Skyway. Main-season variety with a strong plant. Extra-large globe-shaped fruit.

Southern Ripe. Full-season maturity with a medium plant. Deep-oblate fruit that are adapted to cooler conditions.

STM2255. Adaptable determinate variety for both mature green and vine ripe. Mid cover with firm fruit and good shelf life.

Summerhaven. Widely adaptable determinate variety with excellent plant cover and extra-large fruit that ship well.

SV 7631. Midseason variety with medium to strong plant with large to extra-large oblate fruit.

Tasti-Lee. Released for the premium tomato market. A midseason, determinate, jointed hybrid with moderate heat tolerance. Fruit are uniformly green with a high lycopene content and deep-red interior color due to the crimson gene.

Thunderbird (STM5187). Hot-set determinate variety with extra-large, very firm fruit that have good shelf life.

Winterhaven. Mature green, determinate variety is adapted to withstand cooler weather.

Plum and Roma Types

BHN 685. Midseason. Large to extra-large, deep-blocky, globe-shaped fruit. Determinate, vigorous bush with no pruning recommended.

BHN 1045. Uniform large fruit and a deep-blocky shape. A strong determinate plant with an excellent disease package.

Daytona. Midseason compact plant. Blocky-elongated large to extra-large fruit.

Mariana. Midseason. Fruit are predominately extra large and extremely uniform in shape. Fruit wall is thick, and external and internal color are very good, with excellent firmness and shelf life. Determinate, small-to-medium-sized plant with good fruit set.

Picus. Main-season, determinate Roma tomato that is widely adapted. Fruits are large, uniform, and blocky, maturing to a deep-red color with great firmness at the red stage. Medium-to-large, vigorous plant that provides good fruit cover and sets well in hot temperatures.

Shelby. Adaptable determinate Roma tomato that can be used in multiple seasons. Fruits are very firm, have low gel, and a good shelf life. Can be used for mature green and vine ripe markets.

Tachi. Midseason variety with classic saladette shape. Determinate midcompact plant. Fruit size predominately extra large, uniform, and very similar to Mariana. Wide adaptability and suited for concentrated harvests for vine-ripe and mature-green markets.

Villa. Mid-early season indeterminate extra-large Roma variety with compact growth habit and mid vigor.

Cherry Types

BHN 268. Early to midseason. Tall bush. An extra-firm cherry tomato that holds, packs, and ships well. Determinate, small-to-medium bush with high yields.

BHN 762. Early determinate variety. Globe-shaped fruit.

Sakura. Early indeterminate hybrid.

Sweet Treats. Early main season with wide adaptability. Strong, vigorous, indeterminate plant. Deep-pink, firm, globe-shaped fruit with outstanding flavor potential. Strong against cracking.

Grape Types

BHN 784. Early-midseason determinate grape hybrid. Heat tolerant.

BHN 785. Midseason determinate grape hybrid with a strong set of very uniformly sized and shaped fruit on a vigorous bush with good cover.

BHN 1022. Determinate “hot-set” variety.

Gold Spark. Mid-late. Indeterminate. High-yield yellow grape with consistent brix, great firmness, and excellent shelf life.

Jolly Girl. Early season. Determinate plant. Extended market life with firm, flavorful grape-shaped fruits. Average 10% brix.

Mountain Honey. Semideterminate plant produces high yields of uniform deep-red fruit with very good flavor and sugars.

Mountain Vineyard. Indeterminate grape with deep red color.

Ruby Crush. Mid-early. Determinate with midcompact growth. Deep-red fruit that are very smooth, uniform and firm with a good flavor profile.

Smarty. Early, vigorous, indeterminate bush with short internodes. Plants are 25% shorter than Santa. Sweet and excellent flavor.

Sweethearts. Early to midseason. Indeterminate bush with intermediate internodes. Brilliant-red, firm, elongated grape-shaped fruit. Matures between 70 and 75 days. Good flavor, crack-resistant, and high Brix.

Table 2. Disease-resistance packages for tomato varieties.

	Disease Resistance¹
Large and Beefsteak	
Amelia	R to F-R (1, 2, 3), N, S, TSW, and V (1)
BHN 602	R to F-R (1, 2, 3), TSW, and V (1)
BHN 3353	R to FCR, F-R (1, 2), V (1), and TSW IR to TYLCV
Camaro	R to ASC, F-R (1, 2, 3), and V (1) IR to S and TYLC
Everglade	R to ASC, F-R (1,2,3), S, V (1), IR to TYLCV
Florida 47	R to F-R (1, 2), V (1), ASC, and S
Florida 91	R to F-R (1, 2), V (1), ASC, and S
Grand Marshall	R to ASC, F-R (1, 2) IR to S and TYLC
HM 1823	R to FCR, F-R (1, 2), and V (1) IR to S
Jolene	R to FCR, F-R (1, 2), and V (1) IR to TYLCV
Laguna Red	R to ASC, FCR, F-R (1, 2), ToM, and V (1)
Loretta	R to FCR, F-R (1, 2), S, and V (1)
Red Bounty	R to V (1), F-R (1, 2), S, TSWV, and N
Red Snapper	R to ASC, F-R (1,2), and V (1) IR to S, TSW, and TYLCV
Skyway	R to F-R (1, 2) IR to N, TSW, TYLC
Southern Ripe	R to FCR, F-R(1, 2, 2), TSW IR to N
STM2255	R to ASC, FCR, F-R (1, 2), V (1) IR to S, TSW, and TYLCV
Summerhaven	R to FCR, F-R (1, 2), and V (1) IR to TSW and TYLCV
SV 7631	R to ASC, F-R (1, 2), TSW, V (1) IR to N
Tasti-Lee	R to F-R (1, 2, 3), V (1), and S
Thunderbird (STM5187)	R to ASC, FCR, F-R (1, 2), and V (1) IR to S and TYLCV
Winterhaven	R to FCR, F-R (1, 2), and V (1) IR to TSW and TYLCV
Plum	
BHN 685	R to F-R (1, 2, 3), TSW, and V (1)
BHN 1045	R to F-R (1, 2, 3), TSW, TYLCV, and V (1)
Daytona	R to ASC, F-R (1, 2), N, V (1), IR to TYLCV
Mariana	R to ASC, F-R (1, 2), N, and V (1). IR to S
Picus	R to ASC, TSW, F-R (1, 2), V (1), CLS
Shelby	R to ASC, FCR, F-R (1, 2), BSK, and V (1) IR to TSW and TYLCV
Tachi	R to ASC, F-R (1, 2), N, and V (1) IR to TSW
Villa	R to ASC, F-R (1, 2, 3), and V (1) IR to TSW
Cherry	
BHN 268	R to F-R (1) and V (1)
BHN 762	R to F-R (1) and V (1)
Sakura	R to F-R (1, 2), CLS, and TM
Sweet Treats	R to CLS, F-R (1, 2), and ToM IR to FCR and S
Grape	
BHN 784	R to F-R (1)
BHN 785	R to F-R (1)
BHN 1022	R to F-R (1, 2, 3) and TSW
Gold Spark	R to ToM and CLS
Jolly Girl	R to C and V (1) IR to F-R (1, 2)
Mountain Honey	R to F-R and V (1) IR to TSWV and Late Blight

	Disease Resistance¹
Mountain Vineyard	R to F-R (1, 2, 3) and TSW
Ruby Crush	R to FCR, F-R (1, 2), and ToM IR to S
Smarty	R to F-R (1,2) and V (1)
Sweethearts	R to C, CLS, F-R (1), and TM IR to S

¹ ASC = *Alternaria stem canker* = *Alternaria alternata* f. sp. *lycopersici*; BSK—Bacterial speck—*Pseudomonas syringae* pv *tomato*; C—Cracking; CLS—Cladosporium leaf mold—*Cladosporium fulvum*; F-R 1, 2, 3—Fusarium wilt race 1, 2, 3—*Fusarium oxysporum* f. sp. *lycopersici* races 1, 2, 3; FCR—Fusarium crown rot—*Fusarium oxysporum* f. sp. *radicis-lycopersici*; N—Root-knot nematode—*Meloidogyne arenaria*, *M. incognita*, and *M. javanica*; S—Gray leaf spot—*Stemphylium solani*; ToM = Tomato mosaic virus; TM = Tobacco mosaic; TSW = Tomato spotted wilt; TYLC—Tomato yellow leaf curl; V (1) = Verticillium wilt—*Verticillium albo-atrum* and *Verticillium dahliae* race 1. R = Resistant; IR = Intermediate Resistance; T = Tolerant.

Table 3. Herbicides approved for managing weeds in tomato.

Active Ingredient (lb a.i./A)	Trade Name (Product/A)	MOA Code	Weeds Controlled/Remarks
Labels change frequently. Be sure to read a current product label before applying any chemical.			
PREPLANT/PREEMERGENCE			
Carfentrazone up to 0.031	(Aim) 1.9 EW or (Aim) 2.0 EC up to 2 fl oz	14	Apply as a preplant burndown for emerged broadleaves up to 4 inches tall or rosettes less than 3 inches across. Good coverage is essential. A nonionic surfactant, methylated seed oil, or crop oil concentrate is recommended. No pretransplant interval.
EPTC 2.6	(Eptam) 7 E 3 pt	8	Annual broadleaves, annual grasses, and suppression of yellow/purple nutsedge. Labeled for transplanted tomatoes grown on low-density mulch. Do not use under high-density, VIF, TIF, or metalized mulches. A 24(c) special local needs label in Florida. 14 day pretransplant interval.
Flumioxazin up to 0.128	(Chateau) 51 WDG up to 4 oz	14	Annual broadleaves and grasses. Apply to row middles of raised plastic-mulched beds that are at least 4 in. higher than the treated row middle and 24 in. bed width. Label is a Third-Party registration (TPR, Inc.). Use without a signed authorization and waiver of liability is a misuse of the product. Tank-mix with a burndown herbicide to control emerged weeds. 0 day pretransplant interval.
Fomesafen 0.25–0.38	(Reflex) 2 EC 1.0–1.5 pt	14	Broadleaves and suppression of yellow/purple nutsedge. Suppression of some annual and perennial grasses. Label is a 24(C) local indemnified label and a waiver of liability must be signed for use. Transplanted crop only. May be applied to bareground production or to plastic-mulched beds following bed formation but prior to laying plastic. Use shields or hooded sprayers if applying to row middles, and prevent contact with the plastic mulch. 7 and 0 day pretransplant interval on bare ground and plastic mulch, respectively. 70 day PHI.
Glyphosate	(various formulations) consult labels	9	Emerged broadleaves, grasses, and nutsedge. Apply as a preplant burndown. Consult label for individual product directions.
Halosulfuron 0.024–0.05	(Sanda, Profine) 75 DF 0.5–1.0 oz	2	Broadleaf weeds and yellow/purple nutsedge. Do not exceed 2 applications of halosulfuron per 12-month period. 7 day pretransplant interval. 30 day PHI.
Imazosulfuron 0.19–0.3	(League) 4.0–6.4 oz	2	Broadleaves and suppression of yellow/purple nutsedge. Apply pretransplant just prior to installation of plastic mulch. 1 day pretransplant interval. 21 day PHI.
Lactofen 0.25–0.5	(Cobra) 2 EC 16–32 fl oz	14	Broadleaves. Label is a Third-Party Registration (TPR, Inc.). Use without a signed authorization and waiver of liability is a misuse of the product. Apply to row middles only with shielded or hooded sprayers. Contact with green foliage or fruit may cause excessive injury. Drift of Cobra treated soil particles onto plant can cause contact injury. Limit of 1 PRE and 1 POST application per growing season. 30 day PHI.
Metribuzin 0.25–0.5	(Sencor DF, TriCor DF) 75 WDG 0.33–0.67 lb (Sencor 4, Metricor) 4 F 0.5–1.0 pt	5	Small emerged weeds less than 1 in. tall. Apply preplant in transplanted tomatoes only. Incorporate to a depth of 2–4 inches. Maximum of 1.0 lb a.i./A within a season. Avoid application for 3 days following cool, wet, or cloudy weather to reduce possible crop injury. 7 day PHI.
Napropamide 1.0–2.0	(Devrinol DF-XT) 50 DF 2.0–4.0 lb (Devrinol 2-XT) 2–4 quarts	15	Annual broadleaves and grasses. For direct-seed or transplanted tomatoes. Apply to well-worked soil that is moist enough to permit thorough incorporation to a depth of 2 in. Incorporate same day as applied.
Oxyfluorfen 0.25–0.5	(Goal 2 XL) 2 EC 1.0–2.0 pt (GoalTender) 4 E	14	Broadleaves. Apply pretransplant just prior to installation of plastic mulch. 30-day pretransplant interval. Mulch may be applied any time during the 30-day interval.
Paraquat 0.5–1.0	(Gramoxone) 2 SL 2.0–4.0 pt (Firestorm) 3 SL 1.3–2.7 pt	22	Emerged broadleaves and grasses. Apply as a preplant burndown treatment. Surfactant recommended. Consult label for new restrictions.
Pelargonic acid	(Scythe) 4.2 EC 3%–10% v/v	27	Emerged broadleaves and grasses. Apply as a preplant burndown treatment or posttransplant with shielded or hooded sprayers. Product is a contact, nonselective, foliar-applied herbicide with no residual control.
Pendimethalin 0.48–0.72	(Prowl H ₂ O) 3.8 1.0–1.5 pt	3	May be applied pretransplant to bed tops just prior to laying the plastic mulch or to row middles. Do not exceed 3.0 pt/A per year. 70 day PHI.

Active Ingredient (lb a.i./A)	Trade Name (Product/A)	MOA Code	Weeds Controlled/Remarks
Pyraflufen 0.001–0.003	(ETX Herbicide) 0.208 EC 0.3–1.25 fl oz	14	Emerged broadleaves less than 4 in. tall or rosettes less than 3 in. diameter. Apply as a preplant burndown treatment. Nonionic surfactant or crop oil concentrate recommended.
Rimsulfuron 0.03–0.06	(Pruvin, Solida) 25 WDG (Matrix) SG 2.0–4.0 oz	2	Annual broadleaves and grasses. Suppression of yellow nutsedge. Requires 0.5–1 in. of rainfall or irrigation within 5 days of application for activation. May be applied as a sequential treatment with a PRE and POST application not exceeding 0.06 lb a.i./A in a single season. 45 day PHI.
S-metolachlor 1.0–1.3	(Brawl, Dual Magnum, Medal) 7.62 EC 1.0–1.33 pt if organic matter less than 3%	15	Annual broadleaves and grasses. Suppression of yellow/purple nutsedge. Apply to bed tops pretransplant just prior to laying the plastic. May also be used in row middles. Research has shown that the 1.33 pt may be too high in some Florida soils except in row middles. 30 day PHI. 90 day PHI if rate exceeds 1.33 pt/A.
Sulfentrazone 0.070–0.19	(Spartan FL) 4F 2.25–6.0 oz	14	Preemergent control of broadleaves and grasses. Applications must be made prior to transplant. Do not apply more than 12 oz per acre per application or per 12-month period.
Trifluralin 0.5	(Treflan, Trifluralin) 4 EC 1 pt (Treflan TR, Trifluralin) 10 G 5 lb	3	Annual broadleaves and grasses. Do not apply in Dade County. Incorporate 4 in. or less within 8 hr of application. Results in Florida are erratic on soils with low organic matter and clay contents. Note that label precautions against planting “nonlisted” vegetable crops within 5 months of application. Do not apply after transplanting.
POSTTRANSPLANT			
Carfentrazone up to 0.031	(Aim) 1.9 EW or (Aim) 2.0 EC up to 2 fl oz	14	Emerged broadleaf weeds. Apply as a hooded application to row middles only. Good coverage is essential. May be tank-mixed with other herbicides. A nonionic surfactant, methylated seed oil, or crop oil concentrate is recommended. 0 day PHI.
Clethodim 0.09–0.25 0.07–0.25	(Arrow, Select) 2 EC 6–16 fl oz (Select Max) 1 EC 9–32 fl oz	1	Perennial and annual grasses. Use higher rates under heavy grass pressure or larger weeds. Surfactant or crop oil concentrate recommended. Consult label. 20 day PHI.
DCPA 6.0–7.5	(Dacthal) W-75 8–10 lb (Dacthal) 6 F 8–10 pt	3	Annual grasses and select broadleaves. Apply to weed-free soil 6–8 weeks after crop is established and growing rapidly or to moist soil in row middles after crop establishment. Note label precautions against replanting nonregistered crops within 8 months.
Diquat 0.5	(Reglone Desiccant) 1 qt	22	Broadleaves and grasses. Apply to row middles only. Maximum of 2 applications per season. Prevent drift to crop. Nonionic surfactant recommended. 30 day PHI.
Halosulfuron 0.024–0.05	(Sanda, Profine) 75 DF 0.5–1.0 oz	2	Broadleaf weeds and yellow/purple nutsedge. Apply 14 days after transplant but before first bloom. Following first bloom apply with shielded or hooded applicator. May be applied to row middles with shielded or hooded sprayer. Do not exceed 2 oz per 12-month period. Surfactant recommended. 30 day PHI.
Imazosulfuron 0.19–0.3	(League) 4.0–6.4 oz	2	Apply postemergence 3 to 5 days after transplant through early bloom. Only apply if no pretransplant application was made. Surfactant recommended. PHI 21 days.
Lactofen 0.25–0.5	(Cobra) 2 EC 16–32 fl oz	14	Broadleaf weeds. Apply to row middles only with shielded or hooded sprayers. Contact with green foliage or fruit can cause excessive injury. Drift of Cobra-treated soil particles onto plants can cause contact injury. Limit of 1 PRE and 1 POST application per growing season. Do not apply within 18 days of transplant. Surfactant recommended. PHI 30 days.
Metribuzin 0.25–0.5	(Sencor DF, TriCor DF) 75 WDG 0.33–0.67 lb (Sencor 4, Metricor) 4 F 0.5–1.0 pt	5	Small, emerged weeds. Apply after transplants or seedlings are well established. Apply in single or multiple applications with a minimum of 14 days between treatments. Maximum of 1.0 lb a.i./A within a season. Avoid application for 3 days following cool, wet, or cloudy weather to reduce possible crop injury. 7 day PHI.
Paraquat 0.5	(Gramoxone) 2 SL 2 pt (Firestorm) 3 SL 1.3 pt	22	Emerged broadleaf and grass weeds. Direct spray over emerged weeds 1–6 in. tall in row middles between mulched beds. Use low pressure and shields to control drift. Do not apply more than 3 times per season. Nonionic surfactant recommended. 30 day PHI. Consult label for new restrictions.

Active Ingredient (lb a.i./A)	Trade Name (Product/A)	MOA Code	Weeds Controlled/Remarks
Pelargonic acid	(Scythe) 4.2 EC 3%–10% v/v	27	Emerged broadleaf and grass weeds. Direct spray to row middles. Product is a contact, nonselective, foliar-applied herbicide with no residual control. May be tank-mixed with several soil residual compounds.
Pendimethalin 0.48–0.72	(Prowl H ₂ O) 3.8 1.0–1.5 pt	3	Broadleaf and grass weeds. May be applied posttransplant to row middles if previously untreated. Do not exceed 3.0 pt/A per year. 70 day PHI.
Rimsulfuron 0.02–0.03	(Pruvin, Solida) 25 WDG (Matrix) SG 1.0–2.0 oz	2	Broadleaves and grasses. May be applied as a sequential treatment with a PRE and POST application not exceeding 0.06 lb a.i./A in a single season. Requires 0.5–1.0 in. of rainfall or irrigation within 5 days of application for activation. Nonionic surfactant or crop oil concentrate recommended. PHI 45 days.
Sethoxydim 0.19–0.28	(Poast) 1.5 EC 1.0–1.5 pt	1	Actively growing grasses. Do not exceed a total of 4.5 pt/A applied in one season. Unsatisfactory results may occur if applied to grasses under stress. Crop oil concentrate recommended. 20 day PHI.
S-metolachlor 1.0–1.3	(Brawl, Dual Magnum, Medal) 7.62 EC 1.0–1.33 pt	15	Annual broadleaf, grasses, and yellow/purple nutsedge. Apply to row middles. Label rates are 1.0–1.33 pt/A if organic matter is less than 3%. Use on a trial basis. Surfactant not recommended. 90 day PHI for rates above 1.33 pt/A. 30 day PHI for rates 1.33 pt/acre or less.
Trifloxysulfuron 0.005–0.009	(Envoke) 75 DG 0.1–0.2 oz	2	Broadleaves and yellow/purple nutsedge. Direct spray solution to the base of transplanted tomato plants. Apply at least 14 days after transplanting and before fruit set. 45 day PHI.
POSTHARVEST			
Diquat 0.5	(Reglone Desiccant) 2.0 pt	22	Minimum of 35 gal/A. Thorough coverage is required. Nonionic surfactant recommended.
Paraquat 0.62–0.94	(Gramoxone) 2 SL 2.4–3.75 pt (Firestorm) 3 SL 1.6–2.5 pt	22	Broadcast spray over the top of the plants after the last harvest. Thorough coverage is required to ensure maximum herbicide burndown. Do not use treated crop for human or animal consumption. Nonionic surfactant recommended.

Table 4. Insecticides labeled for management of arthropod pests on tomato.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
<p>Aphids (including aphid-transmitted viruses, green peach aphid, potato aphid)</p> <p>Labels change frequently. Be sure to read a current product label before applying any chemical. Please refer to Chapter 19 for information on biopesticides, including materials labeled for certified organic production.</p>	1A	*Lannate LV, *SP (methomyl)	LV: 1.5–3.0 pt SP: 0.5–1.0 lb	Do not apply more than 21 pt LV/acre/ crop (15 for tomatillos) or 7 lb SP/acre/crop (5 lb for tomatillos).	48	1	
	1A	*Vydate L (oxamyl)	Foliar: 2.0–4.0 pt	Do not apply more than 32 pt/A per season.	48	3	Minimum 6-day reapplication interval.
	1B	Dimethoate 4 EC (dimethoate)	0.5–1.0 pt	Maximum total rate per year is 1 lb a.i./A.	48	7	
	1B	Malathion 5 (malathion)	1.0–2.5 pt	10 pints	12	1	
	1B	Malathion 8 F (malathion)	1.5 pt				8F can be used in greenhouse.
	3A	*Asana XL (0.66EC) (esfenvalerate)	2.9–9.6 fl oz	Do not apply more than 0.5 lb a.i. per acre per season, or 10 applications at highest rate.	12	1	
	3A	*Baythroid XL (beta-cyfluthrin)	1.6–2.8 fl oz	Do not apply more than 16.8 fl oz per acre per season.	12	0	
	3A	*Brigade 2EC (bifenthrin)	2.1–5.2 fl oz	Make no more than 4 applications per season.	12	1	Do not make applications less than 10 days apart.
	3A	*Danitol 2.4 EC (fenpropathrin)	7–10.67 fl oz	Do not exceed 42.67 fl oz total application/A per season.	24	3	
	3A	Karate with Zeon* (lambda-cyhalothrin)	0.96–1.92 fl oz	Do not apply more than 23.04 fl oz/A per season.	24	5	
	3A	*Mustang (zeta-cypermethrin)	2.4–4.3 oz	Do not apply more than 25.8 fl oz/A per season.	12	1	Do not make applications less than 7 days apart.
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	Do not apply more than 2.88 pints per acre per season.	24	5	
	3A	Pyganic Crop Protection EC 5.0 II (pyrethrins)	4.5–18.0 fl oz	11.25 pints	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. OMRI-listed. Do not apply more than 10 times per season.
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	Do not apply more than 23.04 fl oz/A per season.	24	5	

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	Do not exceed a total of 19.0 fl oz per acre per season.	24	5	See label for limits on each active ingredient.
	3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	19 fl oz	Do not apply more than 57 fl oz/A per 12-month cropping year.	12	7	
	3A + 28	*Voliam Xpress (lambda-cyhalothrin + chlorantraniliprole)	5.0–9.0 fl oz	Do not apply more than 31.0 fl oz/A per season.	24	5	
	4A	Actara (thiamethoxam)	2.0–5.5 oz	Do not exceed a total of 11.0 oz per acre per growing season.	12	0	Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in directions for use to protect pollinators. Minimum interval between applications is 5 days.
	4A	Admire Pro (imidacloprid)	7–10.5 fl oz	Maximum allowed on tomato is 10.5 fl oz/A.	12	21	Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in directions for use to protect pollinators.
	4A	Admire Pro (imidacloprid)	0.6 fl oz per 1000 plants		12	Soil: 0	Greenhouse use: 1 application to mature plants, see label for cautions.
	4A	Admire Pro (imidacloprid)	0.44 fl oz per 10,000 plants		12	21	Planthouse: 1 application. See label.
	4A	Assail 70WP (acetamiprid)	0.6–1.7 oz	Do not exceed a total of 6.8 oz Assail 70WP per acre per growing season, including any pretransplant applications of acetamiprid.	12	7	Do not apply to crop that has been already treated with imidacloprid or thiamethoxam at planting. Begin applications for whitefly when first adults are noticed. Do not make more than 4 applications per season. Do not apply more than once every 7 days.
	4A	Belay 50 WDG (clothianidin)	Foliar: 1.6–2.1 oz	Do not apply more than 6.4 oz per acre per season.	12	7	Do not use an adjuvant. Toxic to bees. Do not release irrigation water from the treated area.
	4A	Belay 50 WDG (clothianidin)	Soil: 4.8–6.4 oz	Do not apply more than 6.4 oz per acre per season.	12	Apply at planting.	See label for application instructions. Do not release irrigation water from the treated area.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	4A	Platinum (thiamethoxam)	5–11 fl oz	Do not exceed a total of 11 fl oz Platinum/A per growing season.	12	30	Soil application. Not for use in nurseries, plant propagation houses, greenhouses, or on plants grown for use as transplants. See label for rotational restrictions. Do not use with other neonicotinoid insecticides.
	4A	Platinum 75 SG (thiamethoxam)	1.66–3.67 oz	Do not exceed a total of 3.67 Platinum 75 SG/A per growing season.	12	30	
	4A	Safari 20 SG (dinotefuran)	7.0–14.0 oz		12	1	For transplant production only. Can be applied as foliar spray or soil drench.
	4A	Scorpion (dinotefuran)	Soil: 9–10.5 fl oz Foliar: 2–7 fl oz	Do not apply more than 21 fl oz/A per season as a soil application. Do not apply more than 10.5 fl oz/A per season foliarly.	12	1	Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in the directions for use to protect pollinators. Do not combine soil and foliar applications. Use one method or the other.
	4A	Venom 20 SG (dinotefuran)	Foliar: 1–4 oz/A	Do not apply more than 1.34 lb/A per season.	12	1	Toxic to honeybees.
	4A	Venom 20 SG (dinotefuran)	Soil: 5–7.5 oz/A	Do not apply more than 2.68 lb/A per season.	12	21	
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	Do not exceed a total of 13.0 fl oz/A per growing season.	12	30	Several methods of soil application—see label.
	4A + 28	Voliam Flexi (thiamethoxam + chlorantraniliprole)	4.0–7.0 oz	Do not exceed 14 oz/A per season.	12	1	Do not use in greenhouses or on transplants. Do not use if seed has been treated with thiamethoxam or if other Group 4A insecticides will be used. Highly toxic to bees.
	4C	Closer SC (sulfoxaflof)	1.5–2.0 fl oz	Do not exceed 17 fl oz Closer per acre per year.	12	1	
	4D	Sivanto Prime (flupyradifurone)	Soil: 21.0–28.0 fl oz Foliar: 7.0–14.0 fl oz	Do not apply more than 28.0 fl oz per acre per year.	4	Soil: 45 Foliar: 1	Minimum interval between applications: 7 days.
	9B	Fulfill (pymetrozine)	2.75 oz	Do not apply more than 5.5 oz/acre per crop.	12	0	
	9B	PQZ (pyrifluquinazon)	2.4–3.2 fl oz	Do not apply more than 4.8 fl oz per acre per crop cycle.	12	1	Allow a minimum of 7 days between applications.
	9D	Sefina (afidopyropen)	3.0 fl oz	Do not apply more than 28 fl oz Sefina per acre per season.	12	0	Minimum retreatment interval: 7 days.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	23	Movento (spirotetramat)	4.0–5.0 fl oz	Maximum of 10 fl oz/acre per season.	24	1	
	28	Exirel (cyantraniliprole)	13.5–20.5 fl oz	Do not apply a total of more than 0.4 lb a.i./A per crop.	12	1	Application restrictions exist for this product because of risk to bees and other pollinators. Follow application restrictions found in the directions for use to protect pollinators. Minimum application interval between treatments is 5 days.
	28	Verimark (cyantraniliprole)	Tray drench/transplant water: 6.75–13.5 fl oz Drip: 6.75–10 fl oz	Do not apply a total of more than 0.4 lb a.i./A per crop.	4	1	
	29	Beleaf 50 SG (flonicamid)	2.0–2.8 oz	Do not apply more than 8.4 oz per acre per season.	12	0	Begin applications before pests reach damaging levels. Do not apply more than 2 applications per season. Allow a minimum of 7 days between applications.
	-	Aza-Direct (azadirachtin)	1–2 pt, up to 3.5 pt, if needed		4	0	Antifeedant, repellent; insect growth regulator. OMRI-listed.
	-	Azatin XL (azadirachtin)	5–21 fl oz		4	0	Antifeedant, repellent; insect growth regulator.
	-	BotaniGard ES (<i>Beauveria bassiana</i> strain GHA)	0.25–1 quart per acre. Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.		4	0	
	-	Grandevo (<i>Chromobacterium subtsugae</i>)	1.0–3.0 lb		4	0	Thorough coverage is necessary for effective control.
	-	Molt-X (azadirachtin)	10 fl oz		4	0	Antifeedant, repellent; insect growth regulator. OMRI-listed.
	-	M-Pede 49% EC (soap, insecticidal)	1%–2% v/v		12	0	OMRI-listed.
	-	Mycotrol ESO (<i>Beauveria bassiana</i> strain GHA)	0.25–1 quart per acre. Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.		4	0	OMRI-listed.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	-	Neemix 4.5 (azadirachtin)	4.0–16.0 fl oz		12	0	IGR, feeding repellent. OMRI-listed.
	-	PFR-97 (<i>Isaria fumosorosea</i> Apopka strain 97)	1.0–2.0 lb		4	0	Repeat applications at 3–10 days are needed to maintain control. Can be used in greenhouse for food crop transplants raised to be planted into the field. OMRI-listed.
	-	Requiem 25EC (extract of <i>Chenopodium ambrosioides</i>)	2–4 qt	Limited to 10 applications per crop cycle.	4	0	Begin applications before pests reach damaging levels.
	-	SuffOil-X (mineral oil)	1–2 gallons per 100 gallons of water.		4		OMRI-listed.
	-	Ultra Fine Oil, Saf-T-Side, JMS Stylet-Oil, others (oil, insecticidal)	1.0–2.0 gal/100 gal JMS: 3.0–6.0 qt/100 gal water		4	0	Do not exceed four applications per season. Organic Stylet-Oil and Saf-T-Side are OMRI-listed.
Beetles (including beetle larvae, blister beetles, Colorado potato beetle, cucumber beetles, flea beetles)	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 0.63–2.5 lb XLR, 4F: 0.5–2.0 qt	Do not apply a total of more than 10 lb or 8 qt per acre per crop.	12	3	Do not apply more than seven times.
	1A	*Vydate L (oxamyl)	Foliar: 2.0–4.0 pt	Do not apply more than 32 pt/A per season.	48	3	
	3A	*Ambush 25W (permethrin)	3.2–12.8 oz	Do not apply more than 76.8 oz/A per season.	12	up to day of harvest	Do not use on cherry tomatoes.
	3A	*Asana XL (0.66EC) (esfenvalerate)	2.9–9.6 fl oz	Do not apply more than 0.5 lb a.i. per acre per season, or 10 applications at highest rate.	12	1	
	3A	*Baythroid XL (beta-cyfluthrin)	1.6–2.8 fl oz	Do not apply more than 16.8 fl oz per acre per season.	12	0	
	3A	*Brigade 2EC (bifenthrin)	2.1–5.2 fl oz	Make no more than 4 applications per season.	12	1	Do not make applications less than 10 days apart.
	3A	*Hero (bifenthrin + zeta-cypermethrin)	4.0–10.3 oz	Do not apply more than 43.26 fl oz/A per season.	12	1	Do not make more than 4 applications per season. Do not make applications less than 10 days apart.
	3A	Karate with Zeon* (lambda-cyhalothrin)	0.96–1.92 fl oz	Do not apply more than 23.04 fl oz/A per season.	24	5	
	3A	*Mustang (zeta-cypermethrin)	2.4–4.3 oz	Do not apply more than 25.8 fl oz/A per season.	12	1	Do not make applications less than 7 days apart.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	3A	*Pounce 25 WP (permethrin)	3.2–12.8 oz		12	0	Do not apply to cherry or grape tomatoes (fruit less than 1 inch in diameter). Do not apply more than 0.6 lb a.i. per acre per season.
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	Do not apply more than 2.88 pints per acre per season.	24	5	
	3A	Pyganic Crop Protection EC 5.0 II (pyrethrins)	4.5–18.0 fl oz	11.25 pints	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. OMRI-listed. Do not apply more than 10 times per season.
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	Do not apply more than 23.04 fl oz/A per season.	24	5	
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	Do not exceed a total of 19.0 fl oz per acre per season.	24	5	See label for limits on each active ingredient.
	3A + 4A	*Leverage 360 (beta-cyfluthrin + imidacloprid)	3.8–4.1 fl oz		12	0	
	3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	19 fl oz	Do not apply more than 57 fl oz/A per 12-month cropping year.	12	7	
	4A	Actara (thiamethoxam)	2.0–5.5 oz	Do not exceed a total of 11.0 oz/A per growing season.	12	0	Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in directions for use to protect pollinators. Minimum interval between applications is 5 days.
	4A	Admire Pro (imidacloprid)	7–10.5 fl oz	Maximum allowed on tomato is 10.5 fl oz/A.	12	21	Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in directions for use to protect pollinators.
	4A	Assail 70WP (acetamiprid)	0.6–1.7 oz	Do not exceed a total of 6.8 oz Assail 70WP per acre per growing season, including any pretransplant applications of acetamiprid.	12	7	Do not apply to crop that has been already treated with imidacloprid or thiamethoxam at planting. Begin applications for whitefly when first adults are noticed. Do not make more than 4 applications per season. Do not apply more than once every 7 days.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	4A	Belay 50 WDG (clothianidin)	Foliar: 1.6–2.1 oz	Do not apply more than 6.4 oz per acre per season.	12	7	Do not use an adjuvant. Toxic to bees. Do not release irrigation water from the treated area.
	4A	Belay 50 WDG (clothianidin)	Soil: 4.8–6.4 oz	Do not apply more than 6.4 oz per acre per season.	12	Apply at planting.	See label for application instructions. Do not release irrigation water from the treated area.
	4A	Platinum (thiamethoxam)	5–11 fl oz	Do not exceed a total of 11 fl oz Platinum/A per growing season.	12	30	Soil application. Not for use in nurseries, plant propagation houses, greenhouses, or on plants grown for use as transplants. See label for rotational restrictions. Do not use with other neonicotinoid insecticides.
	4A	Platinum 75 SG (thiamethoxam)	1.66–3.67 oz	Do not exceed a total of 3.67 Platinum 75 SG/A per growing season.			
	4A	Scorpion (dinotefuran)	Soil: 9–10.5 fl oz Foliar: 2–7 fl oz	Do not apply more than 21 fl oz/A per season as a soil application. Do not apply more than 10.5 fl oz/A per season foliarly.	12	1	Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in the directions for use to protect pollinators. Do not combine soil and foliar applications. Use one method or the other.
	4A	Venom 20 SG (dinotefuran)	Foliar: 1–4 oz	Do not apply more than 1.34 lb/A per season.	12	1	Toxic to honeybees.
	4A	Venom 20 SG (dinotefuran)	Soil: 5–7.5 oz	Do not apply more than 2.68 lb/A per season.	12	21	
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	Do not exceed a total of 13.0 fl oz/A per growing season.	12	30	Several methods of soil application—see label.
	4A + 28	Voliam Flexi (thiamethoxam + chlorantraniliprole)	4.0–7.0 oz	Do not exceed 14 oz/A per season.	12	1	Foliar applied. Do not use in greenhouses or on transplants. Do not use if seed has been treated with thiamethoxam or if other Group 4A insecticides will be used. Highly toxic to bees.
	4D	Sivanto Prime (flupyradifurone)	7.0–14.0 fl oz	Do not apply more than 28.0 fl oz/A per season.	4	1	Minimum interval between applications: 7 days.
	5	Entrust (spinosad)	0.5–2.5 oz	Do not apply more than 9 oz per acre per crop.	4	1	OMRI-listed. For thrips, rotate to other class of effective insecticide after 2 applications of a Group 5 insecticide for at least 2 applications.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	6	*Proclaim (emamectin benzoate)	2.4–4.8 oz	No more than 28.8 oz/A per season.	12	7	Do not use in greenhouses, nurseries, plant propagation houses, or on any plants grown for use as transplants.
	15	Rimon 0.83EC (novaluron)	9.0–12.0 fl oz	Do not apply more than 36 fl oz per acre per season.	12	1	Minimum of 7 days between applications.
	17	Trigard (cyromazine)	2.66 oz	Do not apply more than 15.96 oz/A per season.	12	0	No more than 6 applications per crop. Does not control CPB adults. Most effective against 1st + 2nd instar larvae.
	28	Coragen (chlorantraniliprole)	3.5–7.5 fl oz	Do not apply more than 15.4 fl oz per acre per crop.	4	1	Can be applied by drip chemigation or as a soil application at planting. See label for details.
	28	Exirel (cyantraniliprole)	7–20.5 fl oz	Do not apply a total of more than 0.4 lb a.i./A per crop.	12	1	Application restrictions exist for this product because of risk to bees and other pollinators. Follow application restrictions found in the directions for use to protect pollinators. Minimum application interval between treatments is 5 days.
	28	Verimark (cyantraniliprole)	Tray drench/transplant water: 6.75–13.5 fl oz Drip: 6.75–10 fl oz	Do not apply more than 0.4 lb a.i./A per crop.	4	1	
	-	Aza-Direct (azadirachtin)	1–2 pt, up to 3.5 pt if needed		4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed.
	-	Azatin XL (azadirachtin)	5–21 fl oz		4	0	Antifeedant, repellent, insect growth regulator.
	-	Neemix 4.5 (azadirachtin)	4.0–16.0 fl oz		12	0	IGR, feeding repellent. OMRI-listed.
	-	SuffOil-X (mineral oil)	1–2 gallons per 100 gallons of water.		4		OMRI-listed.
	-	Surround WP (kaolin)	12.5–50 lb		4	0	OMRI-listed.
	-	Ultra Fine Oil, Saf-T-Side, JMS Stylet-Oil, others (oil, insecticidal)	1.0–2.0 gal/100 gal JMS: 3.0–6.0 qt/100 gal water		4	0	Do not exceed four applications per season.

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Caterpillars (including cabbage looper, corn earworm, garden webworm, hornworms, imported hornworm, cabbageworm, loopers, saltmarsh caterpillar, tobacco budworm, tomato fruitworm; armyworms [beet armyworm, fall armyworm, southern armyworm, true armyworm, yellowstriped armyworm]; cutworms [black cutworm, granulate cutworm])	1A	*Lannate SP (methomyl)	0.5–1.0 lb		48	1	
	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 0.63–2.5 lb XLR, 4F: 1.0–2.0 qt	Do not apply a total of more than 10 lb or 8 qt per acre per crop.	12	3	Do not apply more than seven times.
	1A	10% Sevin Granules (carbaryl)	20 lb		12	3	Maximum of 4 applications, not more often than once every 7 days.
	1B	*Diazinon AG500; *50W (diazinon)	AG500: 1–4 qt 50W: 2–8 lb	Do not make more than one soil application per year, regardless of target pest.	48	preplant	Incorporate into soil—see label.
	3A	*Ambush 25W (permethrin)	3.2–12.8 oz	Do not apply more than 76.8 oz/A per season.	12	up to day of harvest	Do not use on cherry tomatoes.
	3A	*Asana XL (0.66EC) (esfenvalerate)	2.9–9.6 fl oz	Do not apply more than 0.5 lb a.i. per acre per season, or 10 applications at highest rate.	12	1	
	3A	*Baythroid XL (beta-cyfluthrin)	1.6–2.8 fl oz	Do not apply more than 16.8 fl oz per acre per season.	12	0	
	3A	*Brigade 2EC (bifenthrin)	2.1–5.2 fl oz	Make no more than 4 applications per season.	12	1	Do not make applications less than 10 days apart.
	3A	*Danitol 2.4 EC (fenpropathrin)	7–10.67 fl oz	Do not exceed 42.67 fl oz total application/A per season.	24	3	
	3A	*Hero (bifenthrin + zeta-cypermethrin)	4.0–10.3 oz	Do not apply more than 43.26 fl oz/A per season.	12	1	Do not make more than 4 applications per season. Do not make applications less than 10 days apart.
	3A	*Karate with Zeon (lambda-cyhalothrin)	0.96–1.92 fl oz	Do not apply more than 23.04 fl oz/A per season.	24	5	
	3A	*Mustang (zeta-cypermethrin)	2.4–4.3 oz	Do not apply more than 25.8 fl oz/A per season.	12	1	Do not make applications less than 7 days apart.
	3A	*Pounce 25 WP (permethrin)	3.2–12.8 oz		12	0	Do not apply to cherry or grape tomatoes (fruit less than 1 inch in diameter). Do not apply more than 0.6 lb a.i. per acre per season.
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	Do not apply more than 2.88 pints per acre per season.	24	5	
	3A	Pyganic Crop Protection EC 5.0 II (pyrethrins)	4.5–18.0 fl oz	11.25 pints	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. OMRI-listed. Do not apply more than 10 times per season.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	3A	*Warrrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	Do not apply more than 23.04 fl oz/A per season.	24	5	
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	Do not exceed a total of 19.0 fl oz per acre per season.	24	5	See label for limits on each active ingredient.
	3A + 4A	*Leverage 360 (beta-cyfluthrin + imidacloprid)	3.8–4.1 fl oz		12	0	
	3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	19 fl oz	Do not apply more than 57 fl oz/A per 12-month cropping year.	12	7	
	3A + 28	*Besiege (lambda-cyhalothrin + chlorantraniliprole)	5.0–9.0 fl oz	Do not exceed a total of 31 fl oz of Besiege per acre per year.	24	5	
	4A	Platinum (thiamethoxam)	5–11 fl oz	Do not exceed a total of 11 fl oz Platinum/A per growing season.	12	30	Soil application. Not for use in nurseries, plant propagation houses, greenhouses, or on plants grown for use as transplants. See label for rotational restrictions. Do not use with other neonicotinoid insecticides.
	4A	Platinum 75 SG (thiamethoxam)	1.66–3.67 oz	Do not exceed a total 3.67 Platinum 75 SG/A per growing season.			
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	Do not exceed a total of 13.0 fl oz/A per growing season.	12	30	Several methods of soil application—see label.
	4A + 28	Voliain Flexi (thiamethoxam + chlorantraniliprole)	4.0–7.0 oz	Do not exceed 14 oz/A per season.	12	1	Foliar applied. Do not use in greenhouses or on transplants. Do not use if seed has been treated with thiamethoxam or if other Group 4A insecticides will be used. Highly toxic to bees.
	5	Entrust (spinosad)	0.5–2.5 oz	Do not apply more than 9 oz per acre per crop.	4	1	OMRI-listed. For thrips, rotate to other class of effective insecticide after 2 applications of a Group 5 insecticide for at least 2 applications.
	5	Radiant SC (spinetoram)	5–10 fl oz	Do not apply more than 34 fl oz/A per calendar year.	4	1	For thrips, if additional treatment is needed after two applications, switch to an alternate mode of action (not group 5) for at least two applications.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	6	*Proclaim (emamectin benzoate)	2.4–4.8 oz	No more than 28.8 oz/A per season.	12	7	Do not use in greenhouses, nurseries, plant propagation houses, or on any plants grown for use as transplants.
	6 + 28	*Minecto Pro (abamectin + cyantraniliprole)	5.5–10 fl oz	Do not apply more than 20 fl oz per acre per year.	24	7	This label contains pollinator warnings.
	11A	Agree WG (<i>Bacillus thuringiensis</i> subspecies <i>aizawai</i>)	0.5–2.0 lb		4	0	Apply when larvae are small for best control. Can be used in greenhouse. OMRI-listed.
	11A	Biobit HP (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.5–2.0 lb		4	0	Treat when larvae are young. Good coverage is essential. Can be used in the greenhouse. OMRI-listed.
	11A	Crymax WDG (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.5–2.0 lb		4	0	Use high rate for armyworms. Treat when larvae are young.
	11A	Deliver (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.25–1.5 lb		4	0	Use higher rates for armyworms. OMRI-listed.
	11A	DiPel DF (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.25–2.0 lb		4	0	Treat when larvae are young. Good coverage is essential. Can be used for organic production.
	11A	Javelin WG (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.12–1.5 lb		4	0	Treat when larvae are young. Thorough coverage is essential. OMRI-listed.
	11A	Xentari DF (<i>Bacillus thuringiensis</i> subspecies <i>aizawai</i>)	0.5–2.0 lb		4	0	Treat when larvae are young. Thorough coverage is essential. May be used in the greenhouse. Can be used in organic production. OMRI-listed.
	15	Rimon 0.83EC (novaluron)	9.0–12.0 fl oz	Do not apply more than 36 fl oz per acre per season.	12	1	Minimum of 7 days between applications.
	18	Confirm 2F (tebufenozide)	6–16 fl oz	Do not apply more than 64 fl oz per acre per season.	4	7	Product is a slow-acting IGR that will not kill larvae immediately.
	18	Intrepid 2F (methoxyfenozide)	4–16 fl oz	Do not apply more than 64 fl oz per acre per season.	4	1	Product is a slow-acting IGR that will not kill larvae immediately.
	22	Avaunt (indoxacarb)	2.5–3.5 oz	Do not apply more than 14 ounces of product per acre per crop. Minimum spray interval is 5 days.	12	3	
	28	Coragen (chlorantraniliprole)	3.5–7.5 fl oz	Do not apply more than 15.4 fl oz per acre per crop.	4	1	Can be applied by drip chemigation or as a soil application at planting. See label for details.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	28	Exirel (cyantraniliprole)	7–20.5 fl oz	Do not apply a total of more than 0.4 lb a.i./A per crop.	12	1	Application restrictions exist for this product because of risk to bees and other pollinators. Follow application restrictions found in the directions for use to protect pollinators. Minimum application interval between treatments is 5 days.
	28	Verimark (cyantraniliprole)	5–13.5 fl oz	Do not apply more than 0.4 lb a.i./A per crop.	4	1	
	-	Aza-Direct (azadirachtin)	1–2 pt, up to 3.5 pt if needed		4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed.
	-	Azatin XL (azadirachtin)	5–21 fl oz		4	0	Antifeedant, repellent, insect growth regulator.
	-	CheckMate TPW-F (pheromone)	1.2–6.0 fl oz		0	0	For mating disruption of tomato pinworm. See label for details.
	-	Grandevo (<i>Chromobacterium subsugae</i>)	1.0–3.0 lb		4	0	Thorough coverage is necessary for effective control.
	-	MBI-203 EP (<i>Chromobacterium subsugae</i>)	4.0–12.0 quarts		4	0	OMRI-listed. Can be used in the greenhouse.
	-	Molt-X (azadirachtin)	10 fl oz		4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed.
	-	Neemix 4.5 (azadirachtin)	4.0–16.0 fl oz		12	0	IGR, feeding repellent. OMRI-listed.
Fire ants	7A	Extinguish (S-methoprene)	1.0–1.5 lb		4	0	Slow-acting IGR (insect growth regulator).
	7C	Esteem Ant Bait (pyriproxyfen)	1.5–2.0 lb		12	1	Apply when ants are actively foraging.
Lace bugs	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 0.63–2.5 lb XLR, 4F: 0.5–2.0 qt	Do not apply a total of more than 10 lb or 8 qt per acre per crop.	12	3	Do not apply more than seven times.
Leafhoppers	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 0.63–2.5 lb XLR, 4F: 0.5–2.0 qt	Do not apply a total of more than 10 lb or 8 qt per acre per crop.	12	3	Do not apply more than seven times.
	1B	Dimethoate 4 EC (dimethoate)	0.5–1.0 pt	Maximum total rate per year is 1 lb a.i./A.	48	7	Minimum 6-day reapplication interval.
	3A	*Hero (bifenthrin + zeta-cypermethrin)	4.0–10.3 oz	Do not apply more than 43.26 fl oz/A per season.	12	1	Do not make more than 4 applications per season. Do not make applications less than 10 days apart.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	3A	*Karate with Zeon (lambda-cyhalothrin)	0.96–1.92 fl oz	Do not apply more than 23.04 fl oz/A per season.	24	5	
	3A	*Mustang (zeta-cypermethrin)	2.4–4.3 oz	Do not apply more than 25.8 fl oz/A per season.	12	1	Do not make applications less than 7 days apart.
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	Do not apply more than 2.88 pints per acre per season.	24	5	
	3A	Pyganic Crop Protection EC 5.0 II (pyrethrins)	4.5–18.0 fl oz	11.25 pints	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. OMRI-listed. Do not apply more than 10 times per season.
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	Do not apply more than 23.04 fl oz/A per season.	24	5	
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	Do not exceed a total of 19.0 fl oz per acre per season.	24	5	See label for limits on each active ingredient.
	3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	10–19 fl oz	Do not apply more than 57 fl oz/A per 12-month cropping year.	12	7	
	3A + 28	*Voliam Xpress (lambda-cyhalothrin + chlorantraniliprole)	5.0–9.0 fl oz	Do not apply more than 31.0 fl oz/A per season.	24	5	
	4A	Actara (thiamethoxam)	2.0–5.5 oz	Do not exceed a total of 11.0 fl oz per acre per season.	12	0	Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in directions for use to protect pollinators. Minimum interval between applications is 5 days.
	4A	Admire Pro (imidacloprid)	7–10.5 fl oz	Maximum allowed on tomato is 10.5 fl oz/A.	12	21	Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in directions for use to protect pollinators.
	4A	Belay 50 WDG (clothianidin)	Foliar: 1.6–2.1 oz	Do not apply more than 6.4 oz per acre per season.	12	7	Do not use an adjuvant. Toxic to bees. Do not release irrigation water from the treated area.
	4A	Belay 50 WDG (clothianidin)	Soil: 4.8–6.4 oz	Do not apply more than 6.4 oz per acre per season.	12	Apply at planting.	See label for application instructions. Do not release irrigation water from the treated area.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	4A	Platinum (thiamethoxam)	5–11 fl oz	Do not exceed a total of 11 fl oz Platinum/A per growing season.	12	30	Soil application. Not for use in nurseries, plant propagation houses, greenhouses, or on plants grown for use as transplants. See label for rotational restrictions. Do not use with other neonicotinoid insecticides.
	4A	Platinum 75 SG (thiamethoxam)	1.66–3.67 oz	Do not exceed a total of 3.67 Platinum 75 SG/A per growing season.			
	4A	Scorpion (dinotefuran)	Soil: 9–10.5 fl oz Foliar: 2–7 fl oz	Do not apply more than 21 fl oz/A per season as a soil application. Do not apply more than 10.5 fl oz/A per season foliarly.	12	1	Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in the directions for use to protect pollinators. Do not combine soil and foliar applications. Use one method or the other.
	4A	Venom (dinotefuran)	Foliar: 1–4 oz	Do not apply more than 1.34 lb/A per season.	12	1	Use only one application method (soil or foliar). Limited to three applications per season. Toxic to honeybees.
	4A	Venom (dinotefuran)	Soil: 5–7.5 oz	Do not apply more than 2.68 lb/A per season.	12	21	Use only one application method (soil or foliar).
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	Do not exceed a total of 13.0 fl oz per acre per growing season.	12	30	Several methods of soil application—see label.
	4A + 28	Voliam Flexi (thiamethoxam + chlorantraniliprole)	4.0–7.0 oz	Do not exceed 14 oz/A per season.	12	1	Foliar applied. Do not use in greenhouses or on transplants. Do not use if seed has been treated with thiamethoxam or if other Group 4A insecticides will be used. Highly toxic to bees.
	4D	Sivanto Prime (flupyradifurone)	Soil: 21.0–28.0 fl oz Foliar: 7.0–10.5 fl oz	Do not apply more than 28.0 fl oz per acre per year.	4	Soil: 45 Foliar: 1	Minimum interval between applications: 7 days.
	6	*Proclaim (emamectin benzoate)	2.4–4.8 oz	No more than 28.8 oz/A per season.	12	7	Do not use in greenhouses, nurseries, plant propagation houses, or on any plants grown for use as transplants.
	16	Courier 40SC (buprofezin)	9.0–13.6 fl oz	Do not apply more than 27.2 fl oz/A per crop cycle.	12	1	Apply when a threshold is reached of 5 whitefly nymphs per 10 leaflets from the middle of the plant. Product is a slow-acting IGR that will not kill nymphs immediately. No more than 2 applications per season. Allow at least 5 days between applications.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks	
	-	Aza-Direct (azadirachtin)	1–2 pt, up to 3.5 pt if needed		4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed.	
	-	Azatin XL (azadirachtin)	5–21 fl oz		4	0	Antifeedant, repellent, insect growth regulator.	
	-	Molt-X (azadirachtin)	10 fl oz		4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed.	
	-	M-Pede 49% EC (soap, insecticidal)	1%–2% v/v		12	0	OMRI-listed.	
	-	SuffOil-X (mineral oil)	1–2 gallons per 100 gallons of water		4	0	OMRI-listed.	
	-	Surround WP (kaolin)	12.5–50 lb		4	0	OMRI-listed.	
	-	Ultra Fine Oil, Saf-T-Side, JMS Stylet-Oil, others (oil, insecticidal)	1.0–2.0 gal/100 gal JMS: 3.0–6.0 qt/100 gal water		4	0	Do not exceed four applications per season.	
	Liriomyza leafminers	1A	*Vydate L (oxamyl)	Foliar: 2.0–4.0 pt	Do not apply more than 32 pt/A per season.	48	3	
		3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	10–19 fl oz	Do not apply more than 57 fl oz/A per 12-month cropping year.	12	7	
		4A	Venom 20 SG (dinotefuran)	Foliar: 0.44–0.895 lb	Do not apply more than 1.34 lb/A per season.	12	1	Use only one application method (soil or foliar). Limited to three applications per season. Toxic to honeybees.
4A		Venom 20 SG (dinotefuran)	Soil: 1.13–1.34 lb	Do not apply more than 2.68 lb/A per season.	12	21	Use only one application method (soil or foliar). Must have supplemental label for rates over 6.0 oz/acre.	
5		Entrust (spinosad)	0.5–2.5 oz	Do not apply more than 9 oz per acre per crop.	4	1	OMRI-listed. For thrips, rotate to other class of effective insecticide after 2 applications of a Group 5 insecticide for at least 2 applications.	
5		Radiant SC (spinetoram)	5–10 fl oz	Do not apply more than 34 fl oz/A per calendar year.	4	1		
6	*Agri-Mek 0.15 EC (abamectin)	8.0–16.0 fl oz	Do not apply more than 48 fl oz per acre per season.	12	7	Do not make more than 2 sequential applications per season.		
6	*Agri-Mek SC (abamectin)	1.75–3.5 fl oz	Do not apply more than 10.25 fl oz/A in a growing season.	12	7	Do not make more than 2 sequential applications of Agri-Mek SC or any other foliar-applied abamectin-containing product in a growing season.		

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	6 + 28	*Minecto Pro (abamectin + cyantraniliprole)	5.5–10 fl oz	Do not apply more than 20 fl oz per acre per year.	24	7	This label contains pollinator warnings.
	28	Coragen (chlorantraniliprole)	Soil, drip or foliar: 5–7.5 fl oz		4	1	For control of larvae.
	28	Exirel (cyantraniliprole)	13.5–20.5 fl oz	Do not apply a total of more than 0.4 lb a.i./A per crop.	12	1	Foliar applied. Application restrictions exist for this product because of risk to bees and other pollinators. Follow application restrictions found in the directions for use to protect pollinators. Minimum application interval between treatments is 5 days.
	28	Verimark (cyantraniliprole)	Tray drench/transplant water: 6.75–13.5 fl oz Drip: 6.75–10 fl oz	Do not apply more than 0.4 lb a.i./A per crop.	4	1	Soil applied.
	-	Requiem 25EC (extract of <i>Chenopodium ambrosioides</i>)	2–4 qt	Limited to 10 applications per crop cycle.	4	0	Begin applications before pests reach damaging levels.
Mites (including broad mites, two-spotted spider mites, tomato russett mites, carmine spider mites)	1B	Malathion 5; 8F (malathion)	5: 1.0–2.5 pt 8F: 1.5 pt	10 pints	12	1	8F can be used in greenhouse.
	3A	*Brigade 2EC (bifenthrin)	2.1–5.2 fl oz	Make no more than 4 applications per season.	12	1	Do not make applications less than 10 days apart.
	3A	*Danitol 2.4 EC (fenpropathrin)	7–10.67 fl oz	Do not exceed 42.67 fl oz total application/A per season.	24	3	
	3A	*Hero (bifenthrin + zeta-cypermethrin)	4.0–10.3 oz	Do not apply more than 43.26 fl oz/A per season.	12	1	Do not make more than 4 applications per season. Do not make applications less than 10 days apart.
	3A	*Karate with Zeon (lambda-cyhalothrin)	0.96–1.92 fl oz	Do not apply more than 23.04 fl oz/A per season.	24	5	
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	Do not apply more than 2.88 pints per acre per season.	24	5	
	3A	Pyganic Crop Protection EC 5.0 II (pyrethrins)	4.5–18.0 fl oz	11.25 pints	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. OMRI-listed. Do not apply more than 10 times per season.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	10–19 fl oz	Do not apply more than 57 fl oz/A per 12-month cropping year.	12	7	
	6	*Agri-Mek 0.15 EC (abamectin)	8.0–16.0 fl oz	Do not apply more than 48 fl oz per acre per season.	12	7	Do not make more than 2 sequential applications per season.
	6	*Agri-Mek SC (abamectin)	1.75–3.5 fl oz	Do not apply more than 10.25 fl oz/A in a growing season.	12	7	Do not make more than 2 sequential applications of Agri-Mek SC or any other foliar-applied abamectin-containing product in a growing season.
	6 + 28	*Minecto Pro (abamectin + cyantraniliprole)	5.5–10 fl oz	Do not apply more than 20 fl oz per acre per year.	24	7	This label contains pollinator warnings.
	20B	Kanemite 15 SC (acequinocyl)	31 fl oz	Do not apply more than 62 fl oz/A per season.	12	1	Do not use less than 100 gal of water volume per acre. Make no more than 2 applications at least 21 days apart.
	20D	Acramite-50WS (bifenazate)	0.75–1.0 lb	One application allowed per season.	12	3	One application per season. Field grown only. Acramite-50WS is not systemic in action; therefore, complete coverage of both upper and lower leaf surfaces and of fruit is necessary for effective control.
	21A	Portal (fenpyroximate)	2.0 pt	Do not apply more than 4.0 pints/A per crop cycle.	12	1	Do not make more than two applications per growing season. Allow 14 days between applications.
	23	Movento (spirotetramat)	4.0–5.0 fl oz	Maximum of 10 fl oz/ acre per season.	24	1	
	23	Oberon 25C (spiromesifen)	7.0–8.5 fl oz	Maximum amount per crop: 25.5 fl oz/A.	12	1	No more than 3 applications.
	-	Aza-Direct (azadirachtin)	1–2 pt, up to 3.5 pt if needed		4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed.
	-	Grandevo (<i>Chromobacterium subsugae</i>)	1.0–3.0 lb		4	0	Thorough coverage is necessary for effective control.
	-	MET52 EC (<i>Metarhizium anisopliae</i> strain F52)	Drench: 40–80 fl oz Foliar: 0.5 pint–2 qt		0	0	
	-	M-Pede 49% EC (soap, insecticidal)	1%–2% v/v		12	0	OMRI-listed.

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	-	PFR-97 (<i>Isaria fumosorosea</i> Apopka strain 97)	1.0–2.0 lb		4	0	Repeat applications at 3–10 days are needed to maintain control. Can be used in greenhouse for food crop transplants raised to be planted into the field. OMRI-listed.
	-	SuffOil-X (mineral oil)	1–2 gallons per 100 gallons of water.		4		OMRI-listed.
	-	Sulfur (many brands)			24		May burn fruit and foliage when temperature is high. Do not apply within 2 weeks of an oil spray or EC formulation.
	-	Ultra Fine Oil, Saf-T-Side, JMS Stylet-Oil, others (oil, insecticidal)	1.0–2.0 gal/100 gal JMS: 3.0–6.0 qt/100 gal water		4	0	Do not exceed four applications per season.
Mole crickets	1B	*Diazinon AG500 *50 W (diazinon)	AG500: 1–4 qt 50W: 2–8 lb	Do not make more than one soil application per year regardless of target pest.	48	preplant	Incorporate into soil—see label.
Plant bugs & tarnished plant bugs	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 0.63–2.5 lb XLR, 4F: 0.5–2.0 qt	Do not apply a total of more than 10 lb or 8 qt per acre per crop.	12	3	Do not apply more than seven times.
	3A	*Brigade 2EC (bifenthrin)	2.1–5.2 fl oz	Make no more than 4 applications per season.	12	1	Do not make applications less than 10 days apart.
	3A	*Mustang (zeta-cypermethrin)	2.4–4.3 oz	Do not apply more than 25.8 fl oz/A per season.	12	1	Do not make applications less than 7 days apart.
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	Do not apply more than 2.88 pints per acre per season.	24	5	
	3A	Pyganic Crop Protection EC 5.0 II (pyrethrins)	4.5–18.0 fl oz	11.25 pints	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. OMRI-listed. Do not apply more than 10 times per season.
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	Do not apply more than 23.04 fl oz/A per season.	24	5	
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	Do not exceed a total of 19.0 fl oz per acre per season.	24	5	See label for limits on each active ingredient.
	3A + 28	*Besiege (lambda-cyhalothrin + chlorantraniliprole)	5.0–9.0 fl oz	Do not exceed a total of 31 fl oz of Besiege per acre per year.	24	5	

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	4A	Belay 50 WDG (clothianidin)	Foliar: 1.6–2.1 oz	Do not apply more than 6.4 oz per acre per season.	12	7	Do not use an adjuvant. Toxic to bees. Do not release irrigation water from the treated area.
	4A	Belay 50 WDG (clothianidin)	Soil: 4.8–6.4 oz	Do not apply more than 6.4 oz per acre per season.	12	Apply at planting.	See label for application instructions. Do not release irrigation water from the treated area.
	4C	Closer SC (sulfoxaflor)	2.75–4.5 fl oz	Do not apply more than 17 fl oz per acre per year.	12	1	DO NOT APPLY THIS PRODUCT UNTIL AFTER PETAL FALL.
	15	Rimon 0.83EC (novaluron)	9.0–12.0 fl oz	Do not apply more than 36 fl oz per acre per season.	12	1	Minimum of 7 days between applications.
	29	Beleaf 50 SG (flonicamid)	2.0–2.8 oz	Do not apply more than 8.4 oz per acre per season.	12	0	Begin applications before pests reach damaging levels. Do not apply more than 2 applications per season. Allow a minimum of 7 days between applications.
	-	M-Pede 49% EC (soap, insecticidal)	1%–2% v/v		12	0	OMRI-listed.
Planthoppers	16	Courier 40SC (buprofezin)	9.0–13.6 fl oz	Do not apply more than 27.2 fl oz/A per crop cycle.	12	1	Apply when a threshold is reached of 5 whitefly nymphs per 10 leaflets from the middle of the plant. Product is a slow-acting IGR that will not kill nymphs immediately. No more than 2 applications per season. Allow at least 5 days between applications.
Psyllids	4D	Sivanto Prime (flupyradifurone)	7.0–14.0 fl oz	Do not apply more than 28.0 fl oz/A per year.	4	1	Minimum interval between applications: 7 days.
	23	Movento (spirotetramat)	4.0–5.0 fl oz	Maximum of 10 fl oz/acre per season.	24	1	
	-	Neemix 4.5 (azadirachtin)	4.0–16.0 fl oz		12	0	IGR, feeding repellent. OMRI-listed.
Stink bugs (including brown stink bug and green stink bug)	1A	10% Sevin Granules (carbaryl)	20 lb		12	3	Maximum of 4 applications, not more often than once every 7 days.
	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 0.63–2.5 lb XLR, 4F: 0.5–2.0 qt	Do not apply a total of more than 10 lb or 8 qt per acre per crop.	12	3	Do not apply more than seven times.
	3A	*Baythroid XL (beta-cyfluthrin)	1.6–2.8 fl oz	Do not apply more than 16.8 fl oz per acre per season.	12	0	
	3A	*Brigade 2EC (bifenthrin)	2.1–5.2 fl oz	Make no more than 4 applications per season.	12	1	Do not make applications less than 10 days apart.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	3A	*Danitol 2.4 EC (fenpropathrin)	7–10.67 fl oz	Do not exceed 42.67 fl oz total application/A per season.	24	3	
	3A	*Hero (bifenthrin + zeta-cypermethrin)	4.0–10.3 oz	Do not apply more than 43.26 fl oz/A per season.	12	1	Do not make more than 4 applications per season. Do not make applications less than 10 days apart.
	3A	Karate with Zeon* (lambda-cyhalothrin)	0.96–1.92 fl oz	Do not apply more than 23.04 fl oz/A per season.	24	5	
	3A	*Mustang (zeta-cypermethrin)	2.4–4.3 oz	Do not apply more than 25.8 fl oz/A per season.	12	1	Not recommended for vegetable leafminer in Florida. Do not make applications less than 7 days apart.
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	Do not apply more than 2.88 pints per acre per season.	24	5	
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	Do not apply more than 23.04 fl oz/A per season.	24	5	
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	Do not exceed a total of 19.0 fl oz per acre per season.	24	5	See label for limits on each active ingredient.
	3A + 4A	*Leverage 360 (beta-cyfluthrin + imidacloprid)	3.8–4.1 fl oz		12	0	
	3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	10–19 fl oz	Do not apply more than 57 fl oz/A per 12-month cropping year.	12	7	
	3A + 28	*Voliam Xpress (lambda-cyhalothrin + chlorantraniliprole)	5.0–9.0 fl oz	Do not apply more than 31.0 fl oz/A per season.	24	5	
	4A	Actara (thiamethoxam)	2.0–5.5 oz	Do not exceed a total of 11.0 oz/A per growing season.	12	0	Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in directions for use to protect pollinators. Minimum interval between applications is 5 days.
	4A	Belay 50 WDG (clothianidin)	Foliar: 1.6–2.1 oz	Do not apply more than 6.4 oz per acre per season.	12	7	Do not use as an adjuvant. Toxic to bees. Do not release irrigation water from the treated area.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
Thrips: check label for species controlled (includes melon thrips, western flower thrips, Florida flower thrips, eastern flower thrips, foliar feeding thrips, chilli thrips)	4A	Scorpion (dinotefuran)	Soil: 9–10.5 fl oz Foliar: 2–7 fl oz	Do not apply more than 21 fl oz/A per season as a soil application. Do not apply more than 10.5 fl oz/A per season foliarly.	12	1	Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in the directions for use to protect pollinators. Do not combine soil and foliar applications. Use one method or the other.
	4A + 28	Voliam Flexi (thiamethoxam + chlorantraniliprole)	4.0–7.0 oz	Do not exceed 14 oz/A per season.	12	1	Do not use in greenhouses or on transplants. Do not use if seed has been treated with thiamethoxam or if other Group 4A insecticides will be used. Highly toxic to bees.
	15	Rimon 0.83EC (novaluron)	9.0–12.0 fl oz	Do not apply more than 36 fl oz per acre per season.	12	1	Minimum of 7 days between applications.
	-	Aza-Direct (azadirachtin)	1–2 pt, up to 3.5 pt if needed		4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed.
	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 0.63–2.5 lb XLR, 4F: 0.5–2.0 qt	Do not apply a total of more than 10 lb or 8 qt per acre per crop.	12	3	Do not apply more than seven times.
	3A	*Baythroid XL (beta-cyfluthrin)	1.6–2.8 fl oz	Do not apply more than 16.8 fl oz per acre per season.	12	0	
	3A	*Brigade 2EC (bifenthrin)	2.1–5.2 fl oz	Make no more than 4 applications per season.	12	1	Do not make applications less than 10 days apart.
	3A	*Hero (bifenthrin + zeta-cypermethrin)	10.3 oz	Do not apply more than 43.26 fl oz/A per season.	12	1	Do not make more than 4 applications per season. Do not make applications less than 10 days apart.
	3A	Karate with Zeon* (lambda-cyhalothrin)	0.96–1.92 fl oz	Do not apply more than 23.04 fl oz/A per season.	24	5	
	3A	*Mustang (zeta-cypermethrin)	3.4–4.3 oz	Do not apply more than 25.8 fl oz/A per season.	12	1	Do not make applications less than 7 days apart.
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	Do not apply more than 2.88 pints per acre per season.	24	5	
	3A	Pyganic Crop Protection EC 5.0 II (pyrethrins)	4.5–18.0 fl oz	11.25 pints	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. OMRI-listed. Do not apply more than 10 times per season.
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	Do not apply more than 23.04 fl oz/A per season.	24	5	

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	3A + 4A	*Leverage 360 (beta-cyfluthrin + imidacloprid)	3.8–4.1 fl oz		12	0	
	3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	10–19 fl oz	Do not apply more than 57 fl oz/A per 12-month cropping year.	12	7	
	3A + 28	*Voliam Xpress (lambda-cyhalothrin + chlorantraniliprole)	5.0–9.0 fl oz	Do not apply more than 31.0 fl oz/A per season.	24	5	
	4A	Admire Pro (imidacloprid)	7–10.5 fl oz	Maximum allowed on tomato is 10.5 fl oz/A.	12	21	Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in directions for use to protect pollinators.
	4A	Assail 70WP (acetamiprid)	0.6–1.7 oz	Do not exceed a total of 6.8 oz Assail 70WP per acre per growing season including any pretransplant applications of acetamiprid.	12	7	Do not apply to crop that has been already treated with imidacloprid or thiamethoxam at planting. Do not make more than 4 applications per season. Do not apply more than once every 7 days.
	4A	Platinum (thiamethoxam)	5–11 fl oz	Do not exceed a total of 11 fl oz Platinum/A per growing season.	12	30	Soil application. Not for use in nurseries, plant propagation houses, greenhouses, or on plants grown for use as transplants. See label for rotational restrictions. Do not use with other neonicotinoid insecticides.
	4A	Platinum 75 SG (thiamethoxam)	1.66–3.67 oz	Do not exceed a total of 3.67 oz Platinum 75 SG/A per growing season.			
	4A	Scorpion (dinotefuran)	Soil: 9–10.5 fl oz Foliar: 2–7 fl oz	Do not apply more than 21 fl oz/A per season as a soil application. Do not apply more than 10.5 fl oz/A per season foliarly.	12	1	Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in the directions for use to protect pollinators. Do not combine soil and foliar applications. Use one method or the other.
	4A	Venom 20 SG (dinotefuran)	Foliar: 1–4 oz	Do not apply more than 1.34 lb/A per season.	12	1	Use only one application method (soil or foliar). Limited to three applications per season. Toxic to honeybees.
	4A	Venom 20 SG (dinotefuran)	Soil: 5–7.5 oz	Do not apply more than 2.68 lb/A per season.	12	21	Use only one application method (soil or foliar). Must have supplemental label for rates over 6.0 oz/acre.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	Do not exceed a total of 13.0 fl oz/A per growing season.	12	30	Several methods of soil application—see label.
	5	Entrust (spinosad)	0.5–2.5 oz	Do not apply more than 9 oz per acre per crop.	4	1	OMRI-listed. For thrips, rotate to other class of effective insecticide after 2 applications of a Group 5 insecticide for at least 2 applications.
	5	Radiant SC (spinetoram)	5–10 fl oz	Do not apply more than 34 fl oz/A per calendar year.	4	1	For thrips, if additional treatment is needed after two applications, switch to an alternate mode of action (not group 5) for at least two applications.
	6	*Agri-Mek 0.15 EC (abamectin)	8.0–16.0 fl oz	Do not apply more than 48 fl oz per acre per season.	12	7	Do not make more than 2 sequential applications per season.
	6	*Agri-Mek SC (abamectin)	1.75–3.5 fl oz	Do not apply more than 10.25 fl oz/A in a growing season.	12	7	Do not make more than 2 sequential applications of Agri-Mek SC or any other foliar-applied abamectin-containing product in a growing season.
	6 + 28	*Minecto Pro (abamectin + cyantraniliprole)	5.5–10 fl oz	Do not apply more than 20 fl oz per acre per year.	24	7	This label contains pollinator warnings.
	15	Rimon 0.83EC (novaluron)	9.0–12.0 fl oz	Do not apply more than 36 fl oz per acre per season.	12	1	Minimum of 7 days between applications.
	23	Movento (spirotetramat)	4.0–5.0 fl oz	Maximum of 10 fl oz/A per season.	24	1	
	28	Exirel (cyantraniliprole)	13.5–20.5 fl oz	Do not apply a total of more than 0.4 lb a.i./A per crop.	12	1	Application restrictions exist for this product because of risk to bees and other pollinators. Follow application restrictions found in the directions for use to protect pollinators. Minimum application interval between treatments is 5 days.
	28	Verimark (cyantraniliprole)	10.0–13.5 fl oz	Do not apply more than 0.4 lb a.i./A per crop.	4	1	
	29	Beleaf 50 SG (flonicamid)	4.2 oz	Do not apply more than 8.4 oz per acre per season.		0	Begin applications before pests reach damaging levels. Do not apply more than 2 applications per season. Allow a minimum of 7 days between applications.
	-	Aza-Direct (azadirachtin)	1–2 pt, up to 3.5 pt if needed		4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	-	Azatin XL (azadirachtin)	5–21 fl oz		4	0	Antifeedant, repellent, insect growth regulator.
	-	BotaniGard ES (<i>Beauveria bassiana</i> strain GHA)	0.25–1 quart per acre. Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.		4	0	Thorough coverage is necessary for effective control.
	-	Grandevo (<i>Chromobacterium subsugae</i>)	1.0–3.0 lb		4	0	
	-	MET52 EC (<i>Metarhizium anisopliae</i> strain F52)	Drench: 40–80 fl oz Foliar: 0.5 pt–2 qt		0	0	OMRI-listed.
	-	Molt-X (azadirachtin)	10 fl oz		4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed.
	-	M-Pede 49% EC (soap, insecticidal)	1%–2% v/v		12	0	Do not exceed four applications per season.
	-	Mycotrol ESO (<i>Beauveria bassiana</i> strain GHA)	0.25–1 quart/100 gallons		4	0	Repeat applications at 3–10 days as needed to maintain control. Can be used in greenhouse for food crop transplants raised to be planted into the field. OMRI-listed.
	-	PFR-97 (<i>Isaria fumosorosea</i> Apopka strain 97)	1.0–2.0 lb		4	0	Begin applications before pests reach damaging levels.
	-	Requiem 25EC (extract of <i>Chenopodium ambrosioides</i>)	2–4 qt	Limited to 10 applications per crop cycle.	4	0	OMRI-listed.
	-	Suffoil-X (mineral oil)	1%–2% v/v		4	0	OMRI-listed.
	-	Surround WP (kaolin)	12.5–50 lb		4	0	OMRI-listed.
	-	Ultra Fine Oil, Saf-T-Side, JMS Stylet-Oil, others (oil, insecticidal)	1.0–2.0 gal/100 gal JMS: 3.0–6.0 qt/100 gal water		4	0	

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
Weevils (vegetable weevil)	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	Do not apply more than 2.88 pints per acre per season.	24	5	
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	Do not apply more than 23.04 fl oz/A per season.	24	5	See label for limits on each active ingredient.
Whiteflies	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	Do not exceed a total of 19.0 fl oz per acre per season.	24	5	Antifeedant, repellent, insect growth regulator. OMRI-listed.
	-	Aza-Direct (azadirachtin)	1–2 pt, up to 3.5 pt if needed		4	0	Antifeedant, repellent, insect growth regulator.
	-	Azatin XL (azadirachtin)	5–21 fl oz		4	0	
	1A	*Vydate L (oxamyl)	Foliar: 2.0–4.0 pt	Do not apply more than 32 pt/A per season.	48	3	
	3A	*Asana XL (0.66EC) (esfenvalerate)	2.9–9.6 fl oz	Do not apply more than 0.5 lb a.i. per acre per season, or 10 applications at highest rate.	12	1	
	3A	*Baythroid XL (beta-cyfluthrin)	1.6–2.8 fl oz	Do not apply more than 16.8 fl oz per acre per season.	12	0	
	3A	*Brigade 2EC (bifenthrin)	2.1–5.2 fl oz	Make no more than 4 applications per season.	12	1	
	3A	*Danitol 2.4 EC (fenpropathrin)	7–10.67 fl oz	Do not exceed 42.67 fl oz total application/A per season.	24	3	Do not make more than 4 applications per season. Do not make applications less than 10 days apart.
	3A	*Hero (bifenthrin + zeta-cypermethrin)	10.3 oz	Do not apply more than 43.26 fl oz/A per season.	12	1	
	3A	*Karate with Zeon (lambda-cyhalothrin)	0.96–1.92 fl oz	Do not apply more than 23.04 fl oz/A per season.	24	5	
	3A	*Mustang (zeta-cypermethrin)	3.4–4.3 oz	Do not apply more than 25.8 fl oz/A per season.	12	1	
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	Do not apply more than 2.88 pints per acre per season.	24	5	
	3A	Pyganic Crop Protection EC 5.0 II (pyrethrins)	4.5–18.0 fl oz	11.25 pints	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. OMRI-listed. Do not apply more than 10 times per season.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	3A	*Warrrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	Do not apply more than 23.04 fl oz/A per season.	24	5	
	3A + 28	*Besiege (lambda-cyhalothrin + chlorantraniliprole)	5.0–9.0 fl oz	Do not apply more than 31.0 fl oz/A per season.	24	5	Do not make applications less than 10 days apart.
	4A	Actara (thiamethoxam)	2.0–5.5 oz	Do not exceed a total of 11.0 oz/A per growing season.	12	0	Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in directions for use to protect pollinators.
	4A	Admire Pro (imidacloprid)	7–10.5 fl oz	Maximum allowed on tomato is 10.5 fl oz/A.	12	21	Greenhouse use: 1 application to mature plants, see label for cautions.
	4A	Admire Pro (imidacloprid)	0.6 fl oz per 1000 plants		12	Soil: 0	Planthouse: 1 application. See label.
	4A	Admire Pro (imidacloprid)	0.44 fl oz per 10,000 plants		12	21	Do not apply to crop that has been already treated with imidacloprid or thiamethoxam at planting. Begin applications for whitefly when first adults are noticed. Do not make more than 4 applications per season. Do not apply more than once every 7 days.
	4A	Assail 70WP (acetamiprid)	0.6–1.7 oz	Do not exceed a total of 6.8 oz Assail 70WP per acre per growing season, including any pretransplant applications of acetamiprid.	12	7	Do not use an adjuvant. Toxic to bees. Do not release irrigation water from the treated area.
	4A	Belay 50 WDG (clothianidin)	Foliar: 1.6–2.1 oz	Do not apply more than 6.4 oz per acre per season.	12	7	See label for application instructions. Do not release irrigation water from the treated area.
	4A	Belay 50 WDG (clothianidin)	Soil: 4.8–6.4 oz	Do not apply more than 6.4 oz per acre per season.	12	Apply at planting.	Soil application. Not for use in nurseries, plant propagation houses, greenhouses, or on plants grown for use as transplants. See label for rotational restrictions. Do not use with other neonicotinoid insecticides.
	4A	Platinum (thiamethoxam)	5–11 fl oz	Do not exceed a total of 11 fl oz Platinum/A per growing season.	12	30	
	4A	Platinum 75 SG (thiamethoxam)	1.66–3.67 oz	Do not exceed a total of 3.67 Platinum 75 SG/A per growing season.	12	30	Do not apply to crop that has been already treated with imidacloprid or thiamethoxam at planting.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	4A	Safari 20 SG (dinotefuran)	7.0–14.0 oz		12	1	For transplant production only. Can be applied as foliar spray or soil drench.
	4A	Scorpion (dinotefuran)	Soil: 9–10.5 fl oz Foliar: 2–7 fl oz	Do not apply more than 21 fl oz/A per season as a soil application. Do not apply more than 10.5 fl oz/A per season foliarly.	12	21	Use only one application method (soil or foliar). Toxic to honeybees.
	4A	Venom 20 SG (dinotefuran)	Foliar: 1–5 oz	Do not apply more than 1.34 lb/A per season.	12	1	Use only one application method (soil or foliar).
	4A	Venom 20 SG (dinotefuran)	Soil: 5–7.5 oz	Do not apply more than 2.68 lb/A per season.	12	21	Several methods of soil application—see label.
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	Do not exceed a total of 13.0 fl oz/A per growing season.	12	30	Soil applied. Do not use in greenhouses or on transplants. Do not use if seed has been treated with thiamethoxam or if other Group 4A insecticides will be used. Highly toxic to bees.
	4C	Closer SC (sulfoxaflof)	4.25–4.5 fl oz	Do not apply more than 17 fl oz per acre per year.	12	1	DO NOT APPLY THIS PRODUCT UNTIL AFTER PETAL FALL.
	4D	Sivanto Prime (flupyradifurone)	Soil: 21.0–28.0 fl oz Foliar: 10.5–14.0 fl oz	Do not apply more than 28.0 fl oz per acre per year.		Soil: 45 Foliar: 1	
	7C	Knack IGR (pyriproxyfen)	8–10 fl oz	Do not exceed 20 fl oz/A per season.	12	14	
	9B	Fulfill (pymetrozine)	2.75 oz	Do not apply more than 5.5 oz/acre per crop.	12	0	
	9B	PQZ (pyrifluquinazon)	2.3–3.2 fl oz	Do not apply more than 4.8 fl oz per acre per crop cycle.	12	1	
	9D	Sefina (afidopyropen)	14.0 fl oz	Do not apply more than 28 fl oz of Sefina per season.			Minimum retreatment interval: 7 days.
	15	Rimon 0.83EC (novaluron)	9.0–12.0 fl oz	Do not apply more than 36 fl oz per acre per season.	12	1	Immatures only. Apply when a threshold is reached of 5 whitefly nymphs per 10 leaflets from the middle of the plant. Product is a slow-acting IGR that will not kill nymphs immediately. No more than 2 applications per season. Allow at least 5 days between applications.
	16	Courier 40SC (buprofezin)	9.0–13.6 fl oz	Do not apply more than 27.2 fl oz/A per crop cycle.	12	1	Do not make more than two applications per growing season. Allow 14 days between applications.
	21A	Portal (fenpyroximate)	2.0 pt	Do not apply more than 4.0 pints/A per crop cycle.	12	1	

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	23	Movento (spirotetramat)	4.0–5.0 fl oz	Maximum of 10 fl oz/ acre per season.	24	1	No more than 2 applications.
	23	Oberon 25C (spiromesifen)	7.0–8.5 fl oz	Maximum amount per crop: 25.5 fl oz/A.	12	1	
	28	Exirel (cyantraniliprole)	13.5–20.5 fl oz	Do not apply a total of more than 0.4 lb a.i./A per crop.	12	1	Application restrictions exist for this product because of risk to bees and other pollinators. Follow application restrictions found in the directions for use to protect pollinators. Minimum application interval between is 5 days.
	28	Verimark (cyantraniliprole)	Tray drench/transplant water: 6.75–13.5 fl oz Drip: 6.75–10.0 fl oz	Do not apply more than 0.4 lb a.i./A per crop.	4	1	
	29	Beleaf 50 SG (flonicamid)	4.2 oz	Do not apply more than 8.4 oz per acre per season.		0	
	-	Aza-Direct (azadirachtin)	1–2 pt, up to 3.5 pt if needed		4	0	Antifeedant, repellent, insect growth regulator.
	-	Azatin XL (azadirachtin)	5–21 fl oz		4	0	Thorough coverage is necessary for effective control.
	-	BotaniGard ES (<i>Beauveria bassiana</i> strain GHA)	0.25–1.0 quart per acre. Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.		4	0	
	-	Grandevo (<i>Chromobacterium subsugae</i>)	1.0–3.0 lb		4	0	
	-	MET52 EC (<i>Metarhizium anisopliae</i> strain F52)	Drench: 40–80 fl oz Foliar: 0.5 pt–2 qt		0	0	OMRI-listed.
	-	Molt-X (azadirachtin)	10 fl oz		4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed.
	-	M-Pede 49% EC (soap, insecticidal)	1%–2% v/v		12	0	

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks
	-	Mycotrol ESO (<i>Beauveria bassiana</i> strain GHA)	0.25–1 quart per acre. Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.		4	0	OMRI-listed.
	-	Neemix 4.5 (azadirachtin)	4.0–16.0 fl oz		12	0	Repeat applications at 3–10 days are needed to maintain control. Can be used in greenhouse for food crop transplants raised to be planted into the field. OMRI-listed.
	-	PFR-97 (<i>Isaria fumosorosea</i> Apopka strain 97)	1.0–2.0 lb		4	0	Begin applications before pests reach damaging levels.
	-	Requiem 25EC (extract of <i>Chenopodium ambrosioides</i>)	2–4 qt	Limited to 10 applications per crop cycle.	4	0	OMRI-listed.
	-	SuffOil-X (mineral oil)	1–2 gallons per 100 gallons of water.		4		OMRI-listed.
	-	Ultra Fine Oil, Saf-T-Side, JMS Stylet-Oil, others (oil, insecticidal)	1.0–2.0 gal/100 gal JMS: 3.0–6.0 qt/100 gal water		4	0	Organic Stylet-Oil and Saf-T-Side are OMRI-listed.
Wireworms	1B	*Diazinon AG500 *50 W (diazinon)	AG500: 1–4 qt 50W: 2–8 lb	Do not make more than one soil application per year regardless of target pest.	48	preplant	

¹ Mode of Action (MOA) codes for plant pest insecticides from the Insecticide Resistance Action Committee (IRAC) Mode of Action Classification v. 9.4 March 2020. Number codes (1 through 29) are used to distinguish the main insecticide mode of action groups, with additional letters for certain subgroups within each main group. All insecticides within the same group (with same number) indicate the same active ingredient or similar mode of action. This information must be considered for insecticide resistance management decisions. - = unknown, or a mode of action that has not been classified yet.

² Information provided in this table applies only to Florida. Be sure to read a current product label before applying any product. The use of brand names and any mention or listing of commercial products or services in the publication does not imply endorsement by UF/IFAS Extension nor discrimination against similar products or services not mentioned. OMRI-listed: Listed by the Organic Materials Review Institute for use in organic production.

Table 5. Tomato fungicides ordered by disease and then FRAC group according to their mode of action.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
Anthracnose	M1	(copper compounds) Many brands available: Americop 40 DF, Badge SC, Badge X2, Basic Copper 50W HB, Basic Copper 53, Champ DP, Champ F2 FL, Champion WP, Champ WG, C-O-C DF, C-O-C-S WDG, C-O-C WP, Copper Count N, Cueva, Cuprofix Ultra 40D, Kentan DF, Kocide 2000, Kocide 3000, Kocide DF, Nordox, Nordox 75WG, Nu Cop 3L, Nu Cop 50DF, Nu Cop 50WP, Nu Cop HB, Previsto	SEE INDIVIDUAL LABELS		1	Varies from 4 hr to 2 days	Mancozeb enhances the bactericidal effect of fixed copper compounds.
	M3	(mancozeb) Many brands available: Dithane DF, Dithane F45, Dithane M45, Koverall, Manzate FL, Manzate Pro-Stik, Penncozeb 4FL, Penncozeb 75DF, Penncozeb 80WP	SEE INDIVIDUAL LABELS		5	1	
	M3	Ziram 76DF Ziram XCEL (ziram)	4 lb	23.7 lb	7	2	Do not use on cherry tomatoes.
	M3 + M1	ManKocide (mancozeb + copper hydroxide)	5 lb	112 lb	5	2	
	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo Zn, Chloronil 720, Echo 720, Echo 90 DF, Echo Zn, Equus 500 Zn, Equus 720 SST, Equus DF, Initiate 720	SEE INDIVIDUAL LABELS		0	0.5	Use higher rates at fruit set and lower rates before fruit set.
3	Cevya (mefentrifluconazole)	5 fl oz	15 fl oz	0	0.5	Limit is 3 applications per year. Supplemental label expires Oct. 30, 2023	
3	Rhyme (flutriafol)	7 fl oz	28 fl oz	0	0.5	Limit is 4 applications per season.	
3 + 46	Regev (difenoconazole + tea tree oil)	8.5 fl oz	34 fl oz	2	0.5	Limit is 4 applications per year. No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group.	

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
(suppression)	7	Fontelis (penthiopyrad)	24 fl oz	72 fl oz	0	0.5	For disease suppression only. No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. See label for additional instructions pertaining to greenhouse usage.
	7 + 3	Aprovia Top (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz	0	0.5	No more than 2 sequential applications on a 7-day interval before rotating to a non-FRAC group 7 fungicide; subsequent applications on no shorter than a 14-day interval. Limit of 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use.
(suppression)	7 + 11	Luna Sensation (fluopyram + trifloxystrobin)	7.6 fl oz	27.3 fl oz	3	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. Limit of 5 applications per a year.
	9 + 3	Inspire Super (cyprodinil + difenoconazole)	20 fl oz	47 fl oz	0	0.5	Limit is 5 applications per season with no more than 2 sequential applications. Must tank-mix or alternate with another effective fungicide from another FRAC group. Has up to an 8-month plant-back restriction with off-label crops.
	11	(azoxystrobin) Many brands available: AFrame, Arius, AzoxyStar, Azoxystrobin 100ST, Azoxyzone, Azteroid FC, Dynasty, Gold Rush, Heritage, Mazolin, Quadris FL, Satori, Tetraiban, Trevo, Willowood Azoxy 25C	SEE INDIVIDUAL LABELS		0	4 hr	Must alternate or tank-mix with a fungicide from a different FRAC group; see specific label for mixing instructions and precautions.
	11	Flint Gem 500 SC (trifloxystrobin)	Flint: 4 oz Gem: 3.8 fl oz	Flint: 16 oz Gem: 16 fl oz	3	0.5	Limit is 5 applications/crop. Must alternate or tank-mix with a fungicide from a different FRAC group.
	11 + M3	Dexter Max (azoxystrobin + mancozeb)	1.6 lb	12 lb	5	2	Limit is a single application before alternating to a non-FRAC group 11 fungicide.
	11 + M5	Quadris Opti (azoxystrobin + chlorothalonil)	1.6 pt	8 pt	0	0.5	Must alternate with a non-FRAC code 11 fungicide; use of an adjuvant may cause phytotoxicity.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	11 + 3	Quadris Top (azoxystrobin + difenoconazole)	8 fl oz	47 fl oz	0	0.5	Limit is 4 applications per season with no more than 2 sequential applications. Must tank-mix or alternate with another effective fungicide from another FRAC group.
	11 + 3	Topguard EQ (azoxystrobin + flutriafol)	8 fl oz	32 fl oz	0	0.5	Limit is 4 applications per season. Do not use adjuvants or EC formulated tank-mix partners. The addition of silicone- or oil-based additives may cause injury at high temperatures. Do not exceed 0.125% (v/v) adjuvant levels.
	11 + 7	Priaxor (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	Limit is 3 applications per season; no more than 2 sequential applications. See label about compatibility with other formulated products and adjuvants.
	11 + 27	Tanos (famoxadone + cymoxanil)	8 oz	72 oz	3	0.5	Do not alternate or tank-mix with other FRAC group 11 fungicides.
(suppression)	19	Ph-D WDG Oso 5% SC (polyoxin D zinc salt)	Ph-D: 6.2 oz Oso: 13 fl oz	Ph-D: 31.0 oz Oso: 78 fl oz	0	4 hr	Alternate with a non-FRAC code 19 fungicide.
	27 + M5	Ariston Cymbol Advance (cymoxanil + chlorothalonil)	1.9 pt	17.5 pt	3	0.5	Check copper manufacturer's label for specific precautions and limitations for mixing with this product.
	40 + 3	Revus Top (mandipropamid + difenoconazole)	7 fl oz	28 fl oz	1	0.5	Limit is 4 applications per season; no more than 2 sequential applications. Not labeled for transplants.
Bacterial canker	M1	(copper compounds) Many brands available: Americop 40 DF, Badge SC, Badge X2, Basic Copper 50W HB, Basic Copper 53, Champ DP, Champ F2 FL, Champion WP, Champ WG, C-O-C DF, C-O-C-S WDG, C-O-C WP, Copper Count N, Cueva, Cuprofix Ultra 40D, Kentan DF, Kocide 2000, Kocide 3000, Kocide DF, Nordox, Nordox 75WG, Nu Cop 3L, Nu Cop 50DF, Nu Cop 50WP, Nu Cop HB, Previsto	SEE INDIVIDUAL LABELS	SEE INDIVIDUAL LABELS	1	Varies by product from 4 hr to 2 days	Mancozeb enhances the bactericidal effect of fixed copper compounds.
	3 + 46	Regev (difenoconazole + tea tree oil)	8.5 fl oz	34 fl oz	2	0.5	
(suppression)	11 + 27	Tanos (famoxadone + cymoxanil)	8 oz	72 oz	3	0.5	Do not alternate or tank-mix with other FRAC group 11 fungicides.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
Bacterial spot and bacterial speck	M1	(copper compounds) Many brands available: Americop 40 DF, Badge SC, Badge X2, Basic Copper 50W HB, Basic Copper 53, Champ DP, Champ F2 FL, Champion WP, Champ WG, C-O-C DF, C-O-C-S WDG, C-O-C WP, Copper Count N, Cueva, Cuprofix Ultra 40D, Kentan DF, Kocide 2000, Kocide 3000, Kocide DF, Nordox, Nordox 75WG, Nu Cop 3L, Nu Cop 50DF, Nu Cop 50WP, Nu Cop HB, Previsto	SEE INDIVIDUAL LABELS		1	Varies by product from 4 hr to 2 days	Mancozeb enhances the bactericidal effect of fixed copper compounds.
	M3	(mancozeb) Many brands available: Dithane DF, Dithane F45, Dithane M45, Koverall, Manzate FL, Manzate Pro-Stik, Penncozeb 4FL, Penncozeb 75DF, Penncozeb 80WP	SEE INDIVIDUAL LABELS		5	1	Bacterial spot control only when tank-mixed with a copper fungicide.
	M3 + M1	ManKocide (mancozeb + copper hydroxide)	5 lb	112 lb	5	2	
	3 + 46	Regev (difenoconazole + tea tree oil)	8.5 fl oz	34 fl oz	2	0.5	Limit is 4 applications per year. No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group.
	11 + M3	Dexter Max (azoxystrobin + mancozeb)	3.2 lb	12 lb	5	2	Combine with a fixed-copper fungicide. Limit is a single application before alternating to a non-FRAC group 11 fungicide.
	11 + 27	Tanos (famoxadone + cymoxanil)	8 oz	72 oz	3	0.5	Do not alternate or tank-mix with other FRAC group 11 fungicides.
	25	Agri-mycin 50 AG Streptomycin Harbour (streptomycin sulfate)	200 ppm	-	-	0.5	See label for details. For transplant production only. Many isolates are resistant to streptomycin.
	P	Actigard (acibenzolar-S-methyl)	0.75 oz	4.75 oz	14	0.5	Begin applications within one week of transplanting or emergence. Make up to 8 weekly, sequential applications.
	3 + 46	Regev (difenoconazole + tea tree oil)	8.5 fl oz	34 fl oz	2	0.5	Limit is 4 applications per year. No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group.
	Bacterial wilt (<i>Ralstonia solanacearum</i>)						

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
Black mold (<i>Alternaria</i> spp.)	3	Cevya (mefentrifluconazole)	5 fl oz	15 fl oz	0	0.5	Limit is 3 applications per year. Supplemental label expires Oct. 30, 2023
	3	Mentor (propiconazole)	8 oz/100 gal or /50,000 lb of fruit	-	-	-	Apply as a postharvest dip, drench, or high-volume spray for the postharvest control of certain rots. See label for details.
	3	Rhyme (flutriafol)	7 fl oz	28 fl oz	0	0.5	Limit is 4 applications per season.
	3 + 12	Chairman (propiconazole + fludioxonil)	32 fl oz/100 gal or /50,000 lb of fruit	-	-	-	Apply as a postharvest dip, drench, or high-volume spray for the postharvest control of certain rots. Lower rates for small diameter fruit. See label for details.
	3 + 46	Regev (difenoconazole + tea tree oil)	8.5 fl oz	34 fl oz	2	0.5	Limit is 4 applications per year. No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group.
	7	Endura (boscalid)	12.5 oz	25 oz	0	0.5	Alternate with non-FRAC code 7 fungicides; see label.
	7	Fontelis (penthiopyrad)	24 fl oz	72 fl oz	0	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. See label for additional instructions pertaining to greenhouse usage.
	7 + 3	Aprovia Top (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz	0	0.5	No more than 2 sequential applications on a 7-day interval before rotating to a non-FRAC group 7 fungicide; subsequent applications on no shorter than a 14-day interval. Limit of 4 applications per a year. See label for surfactant precautions. Not labeled for greenhouse use.
	7 + 9	Luna Tranquility (fluopyram + pyrimethanil)	11.2 fl oz	54.7 fl oz	1	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. See label for additional instructions pertaining to greenhouse usage.
	7 + 11	Luna Sensation (fluopyram + trifloxystrobin)	7.6 fl oz	27.1 fl oz	3	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. Limit of 5 applications per year.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	7 + 12	Miravis Prime (pydiflumetofen + fludioxonil)	11.4 fl oz	22.8 fl oz	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC group 7 or non-FRAC group 12 fungicide; no more than 2 applications at maximum rate per year; can be applied via chemigation in 0.1–0.25 inches/A of water. Not for use in transplant or greenhouse production.
	9 + 3	Inspire Super (cyprodinil + difenoconazole)	20 fl oz	47 fl oz	0	0.5	Limit is 5 applications per season with no more than 2 sequential applications. Must tank-mix or alternate with another effective fungicide from another FRAC group. Has up to an 8-month plant-back restriction with off-label crops.
	11	(azoxystrobin) Many brands available: AFrame, Arius, Azoxystar, Azoxystrobin 100ST, Azoxyzone, Azteroid FC, Dynasty, Gold Rush, Heritage, Mazolin, Quadris FL, Satori, Tetraban, Trevo, Willowood Azoxy 25C	SEE INDIVIDUAL LABELS		0	4 hr	Must alternate or tank-mix with a fungicide from a different FRAC group; see specific label for mixing instructions and precautions.
	11 + M3	Dexter Max (azoxystrobin + mancozeb)	1.6 lb	12 lb	5	2	Limit is a single application before alternating to a non-FRAC group 11 fungicide.
	11 + M5	Quadris Opti (azoxystrobin + chlorothalonil)	1.6 pt	8 pt	0	0.5	Must alternate with a non-FRAC code 11 fungicide; use of an adjuvant may cause phytotoxicity.
	11 + 3	Quadris Top (azoxystrobin + difenoconazole)	8 fl oz	47 fl oz	0	0.5	Limit is 4 applications per season with no more than 2 sequential applications. Must tank-mix or alternate with another effective fungicide from another FRAC group. Has up to a 1-year plant-back restriction for certain off-label crops.
	11 + 3	Topguard EQ (azoxystrobin + flutriafol)	8 fl oz	32 fl oz	0	0.5	Limit is 4 applications per season. Do not use adjuvants or EC formulated tank-mix partners. The addition of silicone or oil based additives may cause injury at high temperatures. Do not exceed 0.125% (v/v) adjuvant levels.
	11 + 7	Priaxor (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	Limit is 3 applications per season; no more than 2 sequential applications. See label about compatibility with other formulated products and adjuvants.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
(suppression)	27 + M5	Ariston Cymbol Advance (cymoxanil + chlorothalonil)	1.9 pt	17.5 pt	3	0.5	Check copper manufacturer's label for specific precautions and limitations for mixing with this product.
	39	Magister SC (fenazaquin)	36 fl oz	36 fl oz	3	0.5	Also labeled as an acaricide. Limit to 1 application per year.
	40 + 3	Revus Top (mandipropamid + difenoconazole)	7 fl oz	28 fl oz	1	0.5	Limit is 4 applications per season; no more than 2 sequential applications. Not labeled for transplants.
	49 + M5	Orondis Opti (oxathiapiprolin + chlorothalonil)	2.5 pt	10 pt	0	4 hr	Do not use Orondis Opti following a soil application of another oxathiapiprolin product. No more than 2 sequential applications before rotating to another mode of action; 7-day minimum application interval. Applications of Orondis Opti should not exceed more than 33% of the total foliar fungicide applications, or 4 applications per crop, whichever is fewer. Limit on multiple crops is 6 applications per acre per year. Not labeled for greenhouse use.
Botrytis, Gray mold	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo Zn, Chloronil 720, Echo 720, Echo 90 DF, Echo Zn, Equus 500 Zn, Equus 720 SST, Equus DF, Initiate 720	SEE INDIVIDUAL LABELS		0	0.5	Use higher rates at fruit set and lower rates before fruit set.
(suppression)	3 + 12	Chairman (propiconazole + fludioxonil)	32 fl oz/100 gal or /50,000 lb of fruit	-	-	-	Apply as a postharvest dip, drench, or high-volume spray for the postharvest control of certain rots. Lower rates for small-diameter fruit. See label for details.
	7	Endura (boscalid)	12.5 oz	25 oz	0	0.5	Alternate with non-FRAC code 7 fungicides.
	7	Fontelis (penthiopyrad)	24 fl oz	72 fl oz	0	0.5	No more than 2 sequential applications before switching to another effective fungicide with a different mode of action. See label for additional instructions pertaining to greenhouse usage.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	7	Luna Privilege (fluopyram)	6.84 fl oz	13.7 fl oz	0	0.5	No more than 2 sequential applications before switching to another effective fungicide with a different mode of action. See label for additional instructions pertaining to greenhouse usage.
	7 + 9	Luna Tranquility (fluopyram + pyrimethanil)	11.2 fl oz	54.7 fl oz	1	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. See label for additional instructions pertaining to greenhouse usage.
	7 + 11	Luna Sensation (fluopyram + trifloxystrobin)	7.6 fl oz	27.3 fl oz	3	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. Limit of 5 applications per a year.
(suppression)	7 + 11	Priaxor (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	Limit is 3 applications per season; no more than 2 sequential applications. See label about compatibility with other formulated products and adjuvants.
(suppression)	7 + 12	Miravis Prime (pydiflumetofen + fludioxonil)	11.4 fl oz	22.8 fl oz	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC group 7 or non-FRAC group 12 fungicide; no more than 2 applications at maximum rate per year; can be applied via chemigation in 0.1–0.25 inches/A of water. Not for use in transplant or greenhouse production.
	9	Scala SC (pyrimethanil)	7 fl oz	35 fl oz	1	0.5	Use only in a tank mix with another effective non-FRAC code 9 fungicide; has a 30-day plant-back with off-label crops.
	9	Vango (cyprodinil)	7 oz	28 oz	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC group 9 for at least 2 sequential applications; no more than 4 applications per year. Can be applied via chemigation.
	9 + 12	Alterity 62.5WG Switch 62.5WG (cyprodinil + fludioxonil)	14 oz	56 oz per year	0	0.5	After 2 applications, alternate with non-FRAC code 9 or 12 fungicides for next 2 applications. Has a 30-day plant-back with off-label crops.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
(suppression)	11	Cabrio 2.09 F (pyraclostrobin)	16 fl oz	96 fl oz	0	0.5	Only 2 sequential applications allowed. Limit is 6 applications/crop. Must alternate or tank-mix with a fungicide from a different FRAC group.
	12	Spirato GHN (fludioxonil)	7 fl oz	28 fl oz	0	0.5	For use in greenhouse and other enclosed structures only. Limit to 4 applications per year. No more than 2 sequential applications before rotating to a different mode of action for 2 applications.
	14	Botran 75 W (dicloran)	1 lb per 100 gal	5.33 lb	10	0.5	Greenhouse use only. Limit is 4 applications. Seedlings or newly set transplants may be injured.
	17	Decree 50 WDG (fenhexamid)	1.5 lb	6 lb	0	0.5	Transplant and greenhouse use only. Do not make more than 2 consecutive applications.
	19	Ph-D WDG Oso 5% SC (polyoxin D zinc salt)	Ph-D: 6.2 oz Oso: 13 fl oz	Ph-D: 31.0 oz Oso: 78 fl oz	0	4 hr	Alternate with a non-FRAC code 19 fungicide.
	27 + M5	Ariston Cymbol Advance (cymoxanil + chlorothalonil)	1.9 pt	17.5 pt	3	0.5	Check copper manufacturer's label for specific precautions and limitations for mixing with this product.
	49 + M5	Orondis Opti (oxathiapiprolin + chlorothalonil)	2.5 pt	10 pt	0	4 hr	Do not use Orondis Opti following a soil application of another oxathiapiprolin product. No more than 2 sequential applications before rotating to another mode of action; 7-day minimum application interval. Applications of Orondis Opti should not exceed more than 33% of the total foliar fungicide applications, or 4 applications per crop, whichever is fewer. Limit on multiple crops is 6 applications per acre per year. Not labeled for greenhouse use.
Buckeye rot Phytophthora fruit rot (<i>Phytophthora</i> spp.)	M1 + 4	Ridomil Gold Copper (copper hydroxide + mefenoxam)	2 lb	6 lb	14	2	Limited to 3 applications per season. Tank-mix with mancozeb.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	11	(azoxystrobin) Many brands available: AFrame, Arius, Azoxystar, Azoxystrobin 100ST, Azoxyzone, Azteroid FC, Dynasty, Gold Rush, Heritage, Mazolin, Quadris FL, Satori, Tetraaban, Trevo, Willowood Azoxy ZSC	SEE INDIVIDUAL LABELS		0	4 hr	Must alternate or tank-mix with a fungicide from a different FRAC group; see specific label for mixing instructions and precautions.
	11	Cabrio 2.09 F (pyraclostrobin)	16 fl oz	96 fl oz	0	0.5	Only 2 sequential applications allowed. Limit is 6 applications/crop. Must alternate or tank-mix with a fungicide from a different FRAC group; see label.
	11 + M3	Dexter Max (azoxystrobin + mancozeb)	1.6 lb	12 lb	5	2	Limit is a single application before alternating to a non-FRAC group 11 fungicide.
	11 + M5	Quadris Opti (azoxystrobin + chlorothalonil)	1.6 pt	8 pt	0	0.5	Must alternate with a non-FRAC code 11 fungicide; use of an adjuvant may cause phytotoxicity.
(suppression)	11 + 27	Tanos (famoxadone + cymoxanil)	8 oz	72 oz	3	0.5	Do not alternate or tank-mix with other FRAC group 11 fungicides.
	22 + M3	Gavel 75DF (zoxamide + mancozeb)	2.0 lb	16 lb	5	2	See label.
	49 + M5	Orondis Opti (oxathiapiprolin + chlorothalonil)	2.5 pt	10 pt	0	4 hr	Do not use Orondis Opti following a soil application of another oxathiapiprolin product. No more than 2 sequential applications before rotating to another mode of action; 7-day minimum application interval. Applications of Orondis Opti should not exceed more than 33% of the total foliar fungicide applications, or 4 applications per crop, whichever is fewer. Limit on multiple crops is 6 applications per acre per year. Not labeled for greenhouse use.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	49 + 40	Orondis Ultra (oxathiapiprolin + mandipropamid)	8.0 fl oz	32 fl oz	1	4 hr	Do not use Orondis Ultra following a soil application of another oxathiapiprolin product. No more than 2 sequential applications before rotating to another mode of action; 7-day minimum application interval. Applications of Orondis Ultra should not exceed more than 33% of the total foliar fungicide applications, or 4 applications per crop, whichever is fewer. Limit on multiple crops is 6 applications per acre per year. See label for greenhouse instructions.
Early blight	M1	(copper compounds) Many brands available: Americop 40 DF, Badge SC, Badge X2, Basic Copper 50W HB, Basic Copper 53, Champ DP, Champ F2 FL, Champion WP, Champ WG, C-O-C DF, C-O-C-S WDG, C-O-C WP, Copper Count N, Cueva, Cuprofix Ultra 40D, Kentan DF, Kocide 2000, Kocide 3000, Kocide DF, Nordox, Nordox 75WG, Nu Cop 3L, Nu Cop 50DF, Nu Cop 50WP, Nu Cop HB, Previsto	SEE INDIVIDUAL LABELS		1	Varies by product from 4 hr to 2 days.	Mancozeb or maneb enhances bactericidal effect of fix copper compounds. See label for details.
	M3	(mancozeb) Many brands available: Dithane DF, Dithane F45, Dithane M45, Koverall, Manzate FL, Manzate Pro-Stik, Penncozeb 4FL, Penncozeb 75DF, Penncozeb 80WP	SEE INDIVIDUAL LABELS		5	1	
	M3	Ziram 76DF Ziram XCEL (ziram)	4 lb	23.7 lb	7	2	Do not use on cherry tomatoes.
	M3 + M1	ManKocide (mancozeb + copper hydroxide)	5 lb	112 lb	5	2	
	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo Zn, Chloronil 720, Echo 720, Echo 90 DF, Echo Zn, Equus 500 Zn, Equus 720 SST, Equus DF, Initiate 720	SEE INDIVIDUAL LABELS		0	0.5	Use higher rates at fruit set and lower rates before fruit set.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	3	Cevya (mefentrifluconazole)	5 fl oz	15 fl oz	0	0.5	Limit is 3 applications per year. Supplemental label expires Oct. 30, 2023
	3	Rhyme (flutriafol)	7 fl oz	28 fl oz	0	0.5	Limit is 4 applications per season.
	3	Tebuzol 3.6F Toledo 3.6F (tebuconazole)	8 fl oz	48 fl oz	7	0.5	Limit is 6 applications/crop. Minimum application interval of 7 days.
	3 + 46	Regev (difenoconazole + tea tree oil)	8.5 fl oz	34 fl oz	2	0.5	Limit is 4 applications per year. No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group.
	4 + M5	Ridomil Gold Bravo 76.4 W (mefenoxam + chlorothalonil)	3 lb	12 lb	14	2	Limit is 4 applications/crop.
	7	Endura (boscalid)	12.5 oz	25 oz	0	0.5	Alternate with non-FRAC code 7 fungicides.
	7	Fontelis (penthiopyrad)	24 fl oz	72 fl oz	0	0.5	No more than 2 sequential applications before switching to another effective fungicide with a different mode of action. See label for additional instructions pertaining to greenhouse usage.
	7	Luna Privilege (fluopyram)	6.84 fl oz	13.7 fl oz	0	0.5	No more than 2 sequential applications before switching to another effective fungicide with a different mode of action. See label for additional instructions pertaining to greenhouse usage.
	7 + 3	Aprovia Top (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz	0	0.5	No more than 2 sequential applications on a 7-day interval before rotating to a non-FRAC group 7 fungicide; subsequent applications on no shorter than a 14-day interval. Limit of 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use.
	7 + 9	Luna Tranquility (fluopyram + pyrimethanil)	11.2 fl oz	54.7 fl oz	1	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. See label for additional instructions pertaining to greenhouse usage.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	7 + 11	Luna Sensation (fluopyram + trifloxystrobin)	7.6 fl oz	27.3 fl oz	3	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. Limit of 5 applications per year.
	7 + 12	Miravis Prime (pydiflumetofen + fludioxonil)	11.4 fl oz	22.8 fl oz	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC group 7 or non-FRAC group 12 fungicide; no more than 2 applications at maximum rate per year; can be applied via chemigation in 0.1–0.25 inches/A of water. Not for use in transplant or greenhouse production.
	9	Scala SC (pyrimethanil)	7 fl oz	35 fl oz	1	0.5	Use only in a tank mix with another effective non-FRAC code 9 fungicide. Has a 30-day plant-back with off-label crops.
	9	Vango (cyprodinil)	7 oz	28 oz	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC group 9 for at least 2 sequential applications; no more than 4 applications per year. Can be applied via chemigation.
	9 + 3	Inspire Super (cyprodinil + difenoconazole)	20 fl oz	47 fl oz	0	0.5	Limit is 5 applications per season with no more than 2 sequential applications. Must tank-mix or alternate with another effective fungicide from another FRAC group. Has up to an 8-month plant-back restriction with off-label crops.
	9 + 12	Alterity 62.5WG Switch 62.5WG (cyprodinil + fludioxonil)	14 oz	56 oz per year	0	0.5	After 2 applications alternate with non-FRAC code 9 or 12 fungicides for next 2 applications. Has a 30-day plant-back with off-label crops.
	11	(azoxystrobin) Many brands available: AFrame, Arius, Azoxystar, Azoxystrobin 100ST, Azoxyzone, Azteroid FC, Dynasty, Gold Rush, Heritage, Mazolin, Quadris FL, Satori, Tetraaban, Trevo, Willowood Azoxy 25C	SEE INDIVIDUAL LABELS		0	4 hr	Must alternate or tank-mix with a fungicide from a different FRAC group; see specific label for mixing instructions and precautions.
	11	Aftershock Evito Tepera (fluoaxastrobin)	5.7 fl oz Tepera: 12.6 fl oz	22.8 fl oz Tepera: 12.6 fl oz	3	0.5	Limit is 4 applications/crop. Must alternate or tank-mix with a fungicide from a different FRAC group.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	11	Cabrio 2.09 F (pyraclostrobin)	16 fl oz	96 fl oz	0	0.5	Only 2 sequential applications allowed. Limit is 6 applications/crop. Must alternate or tank-mix with a fungicide from a different FRAC group.
	11	Flint Gem 500 SC (trifloxystrobin)	Flint: 4 oz Gem: 3 fl oz	Flint: 16 oz Gem: 16 fl oz	3	0.5	Limit is 5 applications/crop. Must alternate or tank-mix with a fungicide from a different FRAC group.
	11	Reason 500 SC (fenamidone)	8.2 oz	24.6 lb	14	0.5	Must alternate with a fungicide from a different FRAC group. See supplemental label for restrictions and details.
	11 + M3	Dexter Max (azoxystrobin + mancozeb)	1.6 lb	12 lb	5	2	Limit is a single application before alternating to a non-FRAC group 11 fungicide.
	11 + M5	Quadris Opti (azoxystrobin + chlorothalonil)	1.6 pt	8 pt	0	0.5	Must alternate with a non-FRAC code 11 fungicide; use of an adjuvant may cause phytotoxicity.
	11 + 3	Quadris Top (azoxystrobin + difenoconazole)	8 fl oz	47 fl oz	0	0.5	Limit is 4 applications per season with no more than 2 sequential applications. Must tank-mix or alternate with another effective fungicide from another FRAC group. Has up to a 1-year plant-back restriction for certain off-label crops.
	11 + 3	Topguard EQ (azoxystrobin + flutriafol)	8 fl oz	32 fl oz	0	0.5	Limit is 4 applications per season. Do not use adjuvants or EC formulated tank-mix partners. The addition of silicone or oil based additives may cause injury at high temperatures. Do not exceed 0.125% (v/v) adjuvant levels.
	11 + 7	Priaxor (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	Limit is 3 applications per season; no more than 2 sequential applications. See label about compatibility with other formulated products and adjuvants.
	11 + 27	Tanos (famoxadone + cymoxanil)	8 oz	72 oz	3	0.5	Do not alternate or tank-mix with other FRAC group 11 fungicides.
	12	Spirato GHN (fludioxonil)	7 fl oz	28 fl oz	0	0.5	For use in greenhouse and other enclosed structures only. Limit to 4 applications per year. No more than 2 sequential applications before rotating to a different mode of action for 2 applications.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	19	Ph-D WDG Oso 5% SC (polyoxin D zinc salt)	Ph-D: 6.2 oz Oso: 13 fl oz	Ph-D: 31.0 oz Oso: 78 fl oz	0	4 hr	Alternate with a non-FRAC code 19 fungicide.
	22 + M3	Gavel 75DF (zoxamide + mancozeb)	2.0 lb	16 lb	5	2	
	22 + M5	Zingi (zoxamide + chlorothalonil)	36 fl oz	288 fl oz	5	0.5	Limit is 8 applications per season. No more than 2 sequential applications before alternating to a different mode of action.
	27 + M5	Ariston Cymbol Advance (cymoxanil + chlorothalonil)	3.0 pt	17.5 pt	3	0.5	Check copper manufacturer's label for specific precautions and limitations for mixing with this product.
	28	Bruin Previcur Flex Promess (propamocarb hydrochloride)	1.5 pt	7.5 pt	5	0.5	Must tank-mix with chlorothalonil or mancozeb.
	40 + 3	Revus Top (mandipropamid + difenoconazole)	7 fl oz	28 fl oz	1	0.5	Limit is 4 applications per season; no more than 2 sequential applications. Not labeled for transplants.
	49 + M5	Orondis Opti (oxathiapiiprolin + chlorothalonil)	2.5 pt	10 pt	0	4 hr	Do not use Orondis Opti following a soil application of another oxathiapiiprolin product. No more than 2 sequential applications before rotating to another mode of action; 7-day minimum application interval. Applications of Orondis Opti should not exceed more than 33% of the total foliar fungicide applications, or 4 applications per crop, whichever is fewer. Limit on multiple crops is 6 applications per acre per year. Not labeled for greenhouse use.
	7 + 12	Miravis Prime (pydiflumetofen + fludioxonil)	11.4 fl oz	22.8 fl oz	0	0.5	Make first application within 7–14 days after planting and the second application 14–21 days later.
	Fusarium wilt (<i>Fusarium</i> spp.) (suppression)						

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
Gray leaf spot (<i>Stemphylium</i> spp.)	M1	(copper compounds) Many brands available: Americop 40 DF, Badge SC, Badge X2, Basic Copper 50W HB, Basic Copper 53, Champ DP, Champ F2 FL, Champion WP, Champ WG, C-O-C DF, C-O-C-S WDG, C-O-C WP, Copper Count N, Cueva, Cuprofix Ultra 40D, Kentan DF, Kocide 2000, Kocide 3000, Kocide DF, Nordox, Nordox 75WG, Nu Cop 3L, Nu Cop 50DF, Nu Cop 50WP, Nu Cop HB, Previsto	SEE INDIVIDUAL LABELS		1	Varies by product from 4 hr to 2 days.	Mancozeb or maneb enhances bactericidal effect of fixed copper compounds.
	M3	(mancozeb) Many brands available: Dithane DF, Dithane F45, Dithane M45, Koverall, Manzate FL, Manzate Pro-Stik, Penncozeb 4FL, Penncozeb 75DF, Penncozeb 80WP	SEE INDIVIDUAL LABELS		5	1	
	M3 + M1	ManKocide (mancozeb + copper hydroxide)	5 lb	112 lb	5	2	
	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo Zn, Chloronil 720, Echo 720, Echo 90 DF, Echo Zn, Equus 500 Zn, Equus 720 SST, Equus DF, Initiate 720	SEE INDIVIDUAL LABELS		0	0.5	Use higher rates at fruit set and lower rates before fruit set.
	3 + 46	Regev (difenoconazole + tea tree oil)	8.5 fl oz		34 fl oz	2	0.5
	4 + M5	Ridomil Gold Bravo 76.4 W (chlorothalonil + mefenoxam)	3 lb	12 lb	14	2	Limit is 4 applications/crop.
	7 + 3	Aprovia Top (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz	0	0.5	No more than 2 sequential applications on a 7-day interval before rotating to a non-FRAC group 7 fungicide; subsequent applications on no shorter than a 14-day interval. Limit of 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use.
	7 + 9	Luna Tranquility (fluopyram + pyrimethanil)	11.2 fl oz	54.7 fl oz	1	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. See label for additional instructions pertaining to greenhouse usage.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	7 + 11	Luna Sensation (fluopyram + trifloxystrobin)	7.6 fl oz	27.3 fl oz	3	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. Limit of 5 applications per a year.
	7 + 12	Miravis Prime (pydiflumetofen + fludioxonil)	11.4 fl oz	22.8 fl oz	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC group 7 or non-FRAC group 12 fungicide; no more than 2 applications at maximum rate per year; can be applied via chemigation in 0.1–0.25 inches/A of water. Not for use in transplant or greenhouse production.
	9 + 3	Inspire Super (cyprodinil + difenoconazole)	20 fl oz	47 fl oz	0	0.5	Limit is 5 applications per season with no more than 2 sequential applications. Must tank-mix or alternate with another effective fungicide from another FRAC group. Has up to an 8-month plant-back restriction with off-label crops.
	11	Flint Gem 500 SC (trifloxystrobin)	Flint: 4 oz Gem: 3.8 fl oz	Flint: 16 oz Gem: 16 fl oz	3	0.5	Limit is 5 applications/crop. Must alternate or tank-mix with a fungicide from a different FRAC group.
	11 + M3	Dexter Max (azoxystrobin + mancozeb)	1.6 lb	12 lb	5	2	Limit is a single application before alternating to a non-FRAC group 11 fungicide.
	11 + 3	Quadris Top (azoxystrobin + difenoconazole)	8 fl oz	47 fl oz	0	0.5	Limit is 4 applications per season with no more than 2 sequential applications. Must tank-mix or alternate with another effective fungicide from another FRAC group. Has up to a 1-year plant-back restriction for certain off-label crops.
	22 + M3	Gavel 75DF (zoxamide + mancozeb)	2.0 lb	16 lb	5	2	
	27 + M5	Ariston Cymbol Advance (cymoxanil + chlorothalonil)	3.0 pt	17.5 pt	3	0.5	Check copper manufacturer's label for specific precautions and limitations for mixing with this product.
	40 + 3	Revus Top (mandipropamid + difenoconazole)	7 fl oz	28 fl oz	1	0.5	4 applications per season; no more than 2 sequential applications. Not labeled for transplants.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	49 + M5	Orondis Opti (oxathiapiprolin + chlorothalonil)	2.5 pt	10 pt	0	4 hr	Do not use Orondis Opti following a soil application of another oxathiapiprolin product. No more than 2 sequential applications before rotating to another mode of action; 7-day minimum application interval. Applications of Orondis Opti should not exceed more than 33% of the total foliar fungicide applications, or 4 applications per crop, whichever is fewer. Limit on multiple crops is 6 applications per acre per year. Not labeled for greenhouse use.
Late blight	M1	(copper compounds) Many brands available: Americop 40 DF, Badge SC, Badge X2, Basic Copper 50W HB, Basic Copper 53, Champ DP, Champ F2 FL, Champion WP, Champ WG, C-O-C DF, C-O-C-S WDG, C-O-C WP, Copper Count N, Cueva, Cuprofix Ultra 40D, Kentan DF, Kocide 2000, Kocide 3000, Kocide DF, Nordox, Nordox 75WG, Nu Cop 3L, Nu Cop 50DF, Nu Cop 50WP, Nu Cop HB, Previsto	SEE INDIVIDUAL LABELS		1	Varies by product from 4 hr to 2 days	
	M3	(mancozeb) Many brands available: Dithane DF, Dithane F45, Dithane M45, Koverall, Manzate FL, Manzate Pro-Stik, Penncozeb 4FL, Penncozeb 75DF, Penncozeb 80WP	SEE INDIVIDUAL LABELS		5	1	
	M3 + M1	ManKocide (mancozeb + copper hydroxide)	5 lb	112 lb	5	2	
	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo Zn, Chloronil 720, Echo 720, Echo 90 DF, Echo Zn, Equus 500 Zn, Equus 720 SST, Equus DF, Initiate 720	SEE INDIVIDUAL LABELS		0	0.5	Use higher rates at fruit set and lower rates before fruit set.
	4 + M1	Ridomil Gold Copper 64.8 W (mefenoxam + copper hydroxide)	2 lb	6 lb	14	2	Limit is 3 applications/crop. Tank-mix with mancozeb fungicide.
	4 + M3	Ridomil Gold MZ (mefenoxam + mancozeb)	2.5 lb	7.5 lb	5	2	Limit is 3 applications/crop.
	4 + M5	Ridomil Gold Bravo 76.4 W (chlorothalonil + mefenoxam)	3 lb	12 lb	14	2	Limit is 4 applications/crop.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
(suppression)	11	Aftershock Evito Tepera (fluoxastrobin)	5.7 fl oz Tepera: 12.6 fl oz	22.8 fl oz Tepera: 12.6 fl oz	3	0.5	Limit is 4 applications/crop. Must alternate or tank-mix with a fungicide from a different FRAC group.
	11	(azoxystrobin) Many brands available: AFrame, Arius, Azoxystar, Azoxystrobin 100ST, Azoxyzone, Azteroid FC, Dynasty, Gold Rush, Heritage, Mazolin, Quadris FL, Satori, Tetraban, Trevo, Willowood Azoxy 25C	SEE INDIVIDUAL LABELS		0	4 hr	Must alternate or tank-mix with a fungicide from a different FRAC group; see specific label for mixing instructions and precautions.
	11	Cabrio 2.09 F (pyraclostrobin)	16 fl oz	96 fl oz	0	0.5	Only 2 sequential applications allowed. Limit is 6 appl./crop. Must alternate or tank-mix with a fungicide from a different FRAC group.
	11	Flint Gem 500 SC (trifloxystrobin)	Flint: 4 oz Gem: 3.8 fl oz	Flint: 16 oz Gem: 16 fl oz	3	0.5	Limit is 5 appl./crop. Must alternate or tank-mix with a fungicide from a different FRAC group.
	11	Reason 500 SC (fenamidone)	8.2 oz	24.6 lb	14	0.5	Must alternate with a fungicide from a different FRAC group.
	11 + M3	Dexter Max (azoxystrobin + mancozeb)	1.6 lb	12 lb	5	2	Limit is a single application before alternating to a non-FRAC group 11 fungicide.
	11 + M5	Quadris Opti (azoxystrobin + chlorothalonil)	1.6 pt	8 pt	0	0.5	Must alternate with a non-FRAC code 11 fungicide; use of an adjuvant may cause phytotoxicity.
	11 + 3	Topguard EQ (azoxystrobin + flutriafol)	8 fl oz	32 fl oz	0	0.5	Limit is 4 applications per season. Do not use adjuvants or EC formulated tank-mix partners. The addition of silicone- or oil-based additives may cause injury at high temperatures. Do not exceed 0.125% (v/v) adjuvant levels.
(suppression)	11 + 7	Priaxor (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	7	0.5	Limit is 3 applications per season; no more than 2 sequential applications. See label about compatibility with other formulated products and adjuvants.
	11 + 27	Tanos (famoxadone + cymoxanil)	8 oz	72 oz	3	0.5	Do not alternate or tank-mix with other FRAC group 11 fungicides.
	19	Oso 5% SC (polyoxin D zinc salt)	13 fl oz	78 fl oz	0	4 hr	Alternate with a non-FRAC code 19 fungicide.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	21	Ranman (cyazofamid)	2.75 oz	16 oz	0	0.5	Limit is 6 applications/crop.
	22 + M3	Gavel 75DF (zoxamide + mancozeb)	2.0 lb	16 lb	5	2	
	22 + M5	Zingi (zoxamide + chlorothalonil)	36 fl oz	288 fl oz	5	0.5	Limit is 8 applications per season. No more than 2 sequential applications before alternating to a different mode of action.
	27	Curzate 60DF Cymbol (cymoxanil)	5 oz	30 oz per year	3	0.5	Must tank-mix with another effective product.
	27 + M5	Ariston Cymbol Advance (cymoxanil + chlorothalonil)	3.0 pt	17.5 pt	3	0.5	Check copper manufacturer's label for specific precautions and limitations for mixing with this product.
	27 + 28	Cymbol Balance (cymoxanil + propamocarb hydrochloride)	21 fl oz	168 fl oz	5	0.5	Limit is 8 applications per season.
	28	Bruin Previcur Flex Promess (propamocarb hydrochloride)	1.5 pt	7.5 pt	5	0.5	Must tank-mix with chlorothalonil or mancozeb.
	33	Aliette 80 WDG (fosetyl-al)	5 lb	20 lb	14	0.5	See label for warnings concerning the use of copper compounds.
	33	Alude (mono- and dipotassium salts of phosphorous acid)	1.5 qt/acre/25 gal	-	-	4 hr	For transplants only.
	40	Forum (dimethomorph)	6 oz	30 oz	4	0.5	Only 2 sequential applications. See label for details.
	40	Micora (mandipropamid)	8 fl oz/5,000 sq ft	16 fl oz/5,000 sq ft	n/a	4 hr	Micora is only labeled for transplant and retail sale to consumers.
	40	Revus (mandipropamid)	8 fl oz	32 fl oz	1	4 hr	No more than 2 sequential applications. Rotate with another effective fungicide. See label.
	40 + 3	Revus Top (mandipropamid + difenoconazole)	7 fl oz	28 fl oz	1	0.5	4 applications per season; no more than 2 sequential applications. Not labeled for transplants. See label.
	43	Presidio (fluopicolide)	4 fl oz	12 fl oz per season	2	0.5	4 applications per season; no more than 2 sequential applications. 10-day spray interval; tank-mix with another labeled non-FRAC code 43 fungicide; 18-month rotation with off-label crops; see label.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	45 + 40	Zampro (ametoctradin + dimethomorph)	14 fl oz	42 fl oz	4	0.5	Addition of a spreading or penetrating adjuvant is recommended to improve performance. Limit of 3 applications per season.
	49 + M5	Orondis Opti (oxathiapiprolin + chlorothalonil)	2.5 pt	10 pt	0	4 hr	Do not use Orondis Opti following a soil application of another oxathiapiprolin product. No more than 2 sequential applications before rotating to another mode of action; 7-day minimum application interval. Applications of Orondis Opti should not exceed more than 33% of the total foliar fungicide applications, or 4 applications per crop, whichever is fewer. Limit on multiple crops is 6 applications per acre per year. Not labeled for greenhouse use.
	49 + 40	Orondis Ultra (oxathiapiprolin + mandipropamid)	8.0 fl oz	32 fl oz	1	4 hr	Do not use Orondis Ultra following a soil application of another oxathiapiprolin product. No more than 2 sequential applications before rotating to another mode of action; 7-day minimum application interval. Applications of Orondis Ultra should not exceed more than 33% of the total foliar fungicide applications, or 4 applications per crop, whichever is fewer. Limit on multiple crops is 6 applications per acre per year. See label for greenhouse instructions.
Leaf mold	M3	(mancozeb) Many brands available: Dithane DF, Dithane F45, Dithane M45, Koverall, Manzate FL, Manzate Pro-Stik, Penncozeb 4FL, Penncozeb 75DF, Penncozeb 80WP	SEE INDIVIDUAL LABELS		5		
	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo Zn, Chloronil 720, Echo 720, Echo 90 DF, Echo Zn, Equus 500 Zn, Equus 720 SST, Equus DF, Initiate 720	SEE INDIVIDUAL LABELS		0	0.5	Use higher rates at fruit set and lower rates before fruit set.
	3 + 46	Regev (difenoconazole + tea tree oil)	8.5 fl oz		34 fl oz	2	0.5

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	7 + 3	Aprovia Top (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz	0	0.5	No more than 2 sequential applications on a 7-day interval before rotating to a non-FRAC group 7 fungicide; subsequent applications on no shorter than a 14-day interval. Limit of 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use.
	7 + 12	Miravis Prime (pydiflumetofen + fludioxonil)	11.4 fl oz	22.8 fl oz	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC group 7 or non-FRAC group 12 fungicide; no more than 2 applications at maximum rate per year; can be applied via chemigation in 0.1–0.25 inches/A of water. Not for use in transplant or greenhouse production.
	9 + 3	Inspire Super (cyprodinil + difenoconazole)	20 fl oz	47 fl oz	0	0.5	Limit is 5 applications per season with no more than 2 sequential applications. Must tank-mix or alternate with another effective fungicide from another FRAC group. Has up to an 8-month plant-back restriction with off-label crops.
	11 + M3	Dexter Max (azoxystrobin + mancozeb)	1.6 lb	12 lb	5	2	Limit is a single application before alternating to a non-FRAC group 11 fungicide.
	11 + 3	Quadris Top (azoxystrobin + difenoconazole)	8 fl oz	47 fl oz	0	0.5	Limit is 4 applications per season with no more than 2 sequential applications. Must tank-mix or alternate with another effective fungicide from another FRAC group.
	11 + 27	Tanos (famoxadone + cymoxanil)	8 oz	72 oz	3	0.5	Do not alternate or tank-mix with other FRAC group 11 fungicides.
	19	Oso 5% SC (polyoxin D zinc salt)	13 fl oz	78 fl oz	0	4 hr	Alternate with a non-FRAC code 19 fungicide.
	22 + M3	Gavel 75DF (zoxamide + mancozeb)	2.0 lb	16 lb	5	2	
	27 + M5	Ariston Cymbol Advance (cymoxanil + chlorothalonil)	3.0 pt	17.5 pt	3	0.5	Check copper manufacturer's label for specific precautions and limitations for mixing with this product.
	40 + 3	Revus Top (mandipropamid + difenoconazole)	7 fl oz	28 fl oz	1	0.5	4 applications per season; no more than 2 sequential applications. Not labeled for transplants.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	49 + M5	Orondis Opti (oxathiapiprolin + chlorothalonil)	2.5 pt	10 pt	0	4 hr	Do not use Orondis Opti following a soil application of another oxathiapiprolin product. No more than 2 sequential applications before rotating to another mode of action; 7-day minimum application interval. Applications of Orondis Opti should not exceed more than 33% of the total foliar fungicide applications, or 4 applications per crop, whichever is fewer. Limit on multiple crops is 6 applications per acre per year. Not labeled for greenhouse use.
Phytophthora crown rot Phytophthora root rot (<i>Phytophthora</i> spp.)	4	Metastar 2E ReCon 4F (metalaxyl)	2 qt	Metastar: 2 qt ReCon: 6 qt	2	28	Must be soil applied. See labels.
	4	Ridomil Gold SL Ultra Flourish (mefenoxam)	Ridomil: 1 pt Ultra Flourish: 2 pt	Ridomil: 3 pt Ultra Flourish: 6 pt	Ridomil: 28 Ultra Flourish: 7	2*	Do not apply more than 1.5 lb mefenoxam/A per crop to the soil. *There is a reentry interval exemption if material is soil-injected or soil-incorporated.
	11	Reason 500 SC (fenamidone)	8.2 oz	24.6 lb	14	0.5	Must alternate with a fungicide from a different FRAC group. (<i>Phytophthora capsici</i> suppression only)
	14	Terramaster 4EC (etrizadiazole)	7 fl oz	27.4 fl oz	3	0.5	Greenhouse use only.
	21	Ranman (cyazofamid)	2.75 fl oz	16.5 fl oz	0		Apply to the base of plant at the time of transplanting. Make additional applications on a 7-to-10-day schedule if conditions are favorable for disease.
	28	Previcur Flex (propamocarb hydrochloride)	SEE LABEL		5	0.5	Greenhouse application: 6 applications/crop cycle. Do not mix with other products. Can cause phytotoxicity if applied in intense sunlight.
	33	Aliette 80 WDG Linebacker WDG (fosetyl-aluminum)	5 lb	2 lb	14	0.5	See label for warnings concerning the use of copper compounds.
	33	Alude (mono- and dipotassium salts of phosphorous acid)	1.5 qt/acre/25 gal	-	-	4 hr	For transplants only.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	43	Presidio (fluopicolide)	4 fl oz	12 fl oz	2	0.5	4 applications per season; no more than 2 sequential applications. 10-day spray interval; tank-mix with another labeled non-FRAC code 43 fungicide; 18-month rotation with off-label crops.
	45 + 40	Zampro (ametoctradin + dimethomorph)	14 fl oz	42 fl oz	4	0.5	Addition of a spreading or penetrating adjuvant is recommended to improve performance. Limit of 3 applications per season.
	49 + 4	Orondis Gold (oxathiapiprolin + mefenoxam)	55 fl oz	55 fl oz	7	2	Soil applications cannot be combined or followed by foliar applications of Orondis Opti or Orondis Ultra. Not labeled for greenhouse use.
	49 + 40	Orondis Ultra (oxathiapiprolin + mandipropamid)	8.0 fl oz	32 fl oz	1	4 hr	Do not use Orondis Ultra following a soil application of another oxathiapiprolin product. No more than 2 sequential applications before rotating to another mode of action; 7-day minimum application interval. Applications of Orondis Ultra should not exceed more than 33% of the total foliar fungicide applications, or 4 applications per crop, whichever is fewer. Limit on multiple crops is 6 applications per acre per year. See label for greenhouse instructions.
Powdery mildew	M2	(sulfur) Many brands available: Cosavet DF, Kumulus DF, Microfine Sulfur, Micro Sulf, Microthiol Disperss, Sulfur 6L, Sulfur 90W, Super Six, That Flowable Sulfur, Thiolut Jet, Thiosperse 80%, Wettable Sulfur, Wettable Sulfur 92, Yellow Jacket Dusting Sulfur, Yellow Jacket Wettable Sulfur	SEE INDIVIDUAL LABELS		1	1	Follow label closely; may cause leaf burn if applied during high temperatures.
	3	Cevya (mefentrifluconazole)	5 fl oz	15 fl oz	0	0.5	Limit is 3 applications per year. Supplemental label expires Oct. 30, 2023.
	3	Rally 40WSP Sonoma 40WSP (myclobutaniil)	4 oz	1.25 lb	0	1	Note that a 30-day plant-back restriction exists.
	3	Rhyme (flutriafol)	7 fl oz	28 fl oz	0	0.5	Limit is 4 applications per season.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	3	Terraguard Trionic 45C (triflumizole)	4 fl oz/100 gal	16 fl oz	1	0.5	Greenhouse production only. Limit is 4 applications per season.
	3 + 46	Regev (difenoconazole + tea tree oil)	8.5 fl oz	34 fl oz	2	0.5	Limit is 4 applications per year. No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group.
	7	Fontelis (penthiopyrad)	24 fl oz	72 fl oz	0	0.5	No more than 2 sequential applications before switching to another effective fungicide with a different mode of action. See label for additional instructions pertaining to greenhouse usage.
	7	Velum Prime (fluopyram)	6.84 fl oz	13.7 fl oz	0	0.5	For soil application only; the first foliar fungicide application following Velum Prime should be from a different FRAC group.
	7 + 3	Aprovia Top (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz	0	0.5	No more than 2 sequential applications on a 7-day interval before rotating to a non-FRAC group 7 fungicide; subsequent applications on no shorter than a 14-day interval. Limit of 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use.
	7 + 9	Luna Tranquility (fluopyram + pyrimethanil)	11.2 fl oz	54.7 fl oz	1	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. See label for additional instructions pertaining to greenhouse usage.
	7 + 11	Luna Sensation (fluopyram + trifloxystrobin)	7.6 fl oz	27.3 fl oz	3	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. Limit of 5 applications per year.
	7 + 12	Miravis Prime (pydiflumetofen + fludioxonil)	11.4 fl oz	22.8 fl oz	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC group 7 or non-FRAC group 12 fungicide; no more than 2 applications at maximum rate per year; can be applied via chemigation in 0.1–0.25 inches/A of water. Not for use in transplant or greenhouse production.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	9	Vango (cyprodinil)	7 oz	28 oz	0	0.5	Limit is 5 applications per season with no more than rotating to a non-FRAC group 9 for at least 2 sequential applications; no more than 4 applications per year. Can be applied via chemigation.
	9 + 3	Inspire Super (cyprodinil + difenoconazole)	20 fl oz	47 fl oz	0	0.5	Limit is 5 applications per season with no more than 2 sequential applications. Must tank-mix or alternate with another effective fungicide from another FRAC group. Has up to an 8-month plant-back restriction with off-label crops.
	9 + 12	Alterity 62.5WG Switch 62.5WG (cyprodinil + fludioxonil)	14 oz	56 oz per year	0	0.5	After 2 applications, alternate with non-FRAC code 9 or 12 fungicides for next 2 applications. Has a 30-day plant-back with off-label crops.
	11	(azoxystrobin) Many brands available: AFrame, Arius, AzoxyStar, Azoxystrobin 100ST, Azoxyzone, Azteroid FC, Dynasty, Gold Rush, Heritage, Mazolin, Quadris FL, Satori, Tetraban, Trevo, Willowood Azoxy 25C	SEE INDIVIDUAL LABELS		0	4 hr	Must alternate or tank-mix with a fungicide from a different FRAC group; see specific label for mixing instructions and precautions.
	11	Cabrio 2.09 F (pyraclostrobin)	16 fl oz	96 fl oz	0	0.5	Only 2 sequential applications allowed. Limit is 6 applications/crop. Must alternate or tank-mix with a fungicide from a different FRAC group.
	11	Flint Gem 500 SC (trifloxystrobin)	Flint: 4 oz Gem: 3.8 fl oz	Flint: 16 oz Gem: 16 fl oz	3	0.5	Limit is 5 applications/crop; must alternate or tank-mix with a fungicide from a different FRAC group.
	11	Heritage Quadris FL Equation Satori (azoxystrobin)	6.2 fl oz Heritage: 3.2 oz	37 fl oz Heritage: 1.6 lb	0	4 hr	Must alternate or tank-mix with a fungicide from a different FRAC group; use of an adjuvant or tank-mixing with EC products may cause phytotoxicity.
	11 + M3	Dexter Max (azoxystrobin + mancozeb)	1.6 lb	12 lb	5	2	Limit is a single application before alternating to a non-FRAC group 11 fungicide.
	11 + M5	Quadris Opti (azoxystrobin + chlorothalonil)	1.6 pt	8 pt	0	0.5	Must alternate with a non-FRAC code 11 fungicide; use of an adjuvant may cause phytotoxicity.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	11 + 3	Quadris Top (azoxystrobin + difenoconazole)	8 fl oz	47 fl oz	0	0.5	Limit is 4 applications per season with no more than 2 sequential applications. Must tank-mix or alternate with another effective fungicide from another FRAC group. Has up to a 1-year plant-back restriction for certain off-label crops.
	11 + 3	Topguard EQ (azoxystrobin + flutriafol)	8 fl oz	32 fl oz	0	0.5	Limit is 4 applications per season. Do not use adjuvants or EC formulated tank-mix partners. The addition of silicone- or oil-based additives may cause injury at high temperatures. Do not exceed 0.125% (v/v) adjuvant levels.
	11 + 7	Priaxor (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	Limit is 3 applications per season; no more than 2 sequential applications. See label about compatibility with other formulated products and adjuvants.
	12	Spirato GHN (fludioxonil)	7 fl oz	28 fl oz	0	0.5	For use in greenhouse and other enclosed structures only. Limit to 4 applications per year. No more than 2 sequential applications before rotating to a different mode of action for 2 applications.
	19	Ph-D WDG Oso 5% SC (polyoxin D zinc salt)	Ph-D: 6.2 oz Oso: 13 fl oz	Ph-D: 31.0 oz Oso: 78 fl oz	0	4 hr	Alternate with a non-FRAC code 19 fungicide.
(suppression)	39	Torac (tolfenpyrad)	21 fl oz	42 fl oz	1	0.5	Primarily an insecticide. Limit 2 applications per season; 4 applications per year. 14 day minimum application interval.
	40 + 3	Revus Top (mandipropamid + difenoconazole)	7 fl oz	28 fl oz	1	0.5	4 applications per season; no more than 2 sequential applications. Not labeled for transplants.
	50	Prolivo (pyriofenone)	5 fl oz	16 fl	0	4 hr	No more than 2 sequential applications. Limit is 4 applications per year.
	50	Vivando (metrafenone)	15.4 fl oz	46.2 fl oz	0	0.5	3 applications per season; no more than 2 sequential applications. Do not mix with horticultural oils.
	U6	Torino (cyflufenamid)	3.4 oz	10.2 oz	0	4 hr	3 applications per season with at least 14 days between applications.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
Pythium diseases (<i>Pythium</i> spp.)	4	Ridomil Gold GR Ridomil Gold SL Ultra Flourish (mefenoxam)	GR: 20 lb SL, Ultra: 2 pt	GR: 40 lb SL: 3 pt Ultra: 6 pt	GR: 28 SL, Ultra: 7	2*	Do not apply more than 1.5 lb mefenoxam/A per crop to the soil. *There is a reentry interval exemption if material is soil-injected or soil-incorporated. Must be soil applied. See labels.
	4	Metastar 2E ReCon 4F (metalaxyl)	2 qt	Metastar: 6 qt ReCon: 3 qt	2	28	
	14	Terramaster 4EC (etridiazole)	7 fl oz	27.4 fl oz	3	0.5	Greenhouse use only.
	21	Ranman (cyazofamid)	3 fl oz/100 gal	-	0	-	For greenhouse transplant production; make a single application to the seedling tray 1 week prior up to the time of transplanting. Do not use any surfactant.
	28	Bruin Previcur Flex (propamocarb hydrochloride)	SEE INDIVIDUAL LABEL		5	0.5	Greenhouse application: 6 applications/crop cycle. Do not mix with other products. Can cause phytotoxicity if applied in intense sunlight.
	28	Bruin Previcur Flex Promess (propamocarb hydrochloride)	1.5 pt	7.5 pt	5	0.5	(Root rots and seedling diseases) Applied to lower portion of plant and soil, or as a soil drench or drip irrigation.
	33	Alude (mono- and dipotassium salts of phosphorous acid)	1.5 qt/acre/25 gal	-	-	4 hr	For transplants only.
	49 + 4	Orondis Gold (oxathiapiprolin + mefenoxam)	55 fl oz	55 fl oz	7	2	Soil applications cannot be combined or followed by foliar applications of Orondis Opti or Orondis Ultra. Not labeled for greenhouse use.
	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo Zn, Chloronil 720, Echo 720, Echo 90 DF, Echo Zn, Equus 500 Zn, Equus 720 SST, Equus DF, Initiate 720	SEE INDIVIDUAL LABELS		0	0.5	Use higher rates at fruit set and lower rates before fruit set.
	7	Fontelis (penthiopyrad)	1.0–1.6 fl oz/1000 row-ft	24 fl oz	0	0.5	Apply at-plant, preplant incorporated, in-furrow, as a transplant drench, or by drip irrigation.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	7 + 3	Aprovia Top (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz	0	0.5	No more than 2 sequential applications on a 7-day interval before rotating to a non-FRAC group 7 fungicide; subsequent applications on no shorter than a 14-day interval. Limit of 4 applications per a year. See label for surfactant precautions. Not labeled for greenhouse use.
(suppression)	11	Cabrio (pyraclostrobin)	16 oz	96 oz	0	0.5	Limit is 2 sequential applications before alternating to another effective fungicide from a different FRAC group.
(suppression)	11 + 7	Priaxor (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	7	0.5	Limit is 3 applications per season; no more than 2 sequential applications. See label about compatibility with other formulated products and adjuvants.
	14	Blocker 4F Terraclor 75 WP (PCNB)	SEE INDIVIDUAL LABELS		Soil treatment at planting	0.5	See label for application type and restrictions.
	14	Par-Flo 4F (PCNB)	12 fl oz per 100 gal	2 appl.	Soil drench	0.5	Limited to only container-grown plants in nurseries or greenhouses.
	27 + M5	Ariston Cymbol Advance (cymoxanil + chlorothalonil)	1.9 pt	17.5 pt	3	0.5	Check copper manufacturer's label for specific precautions and limitations for mixing with this product.
	49 + M5	Orondis Opti (oxathiapiprolin + chlorothalonil)	2.5 pt	10 pt	0	4 hr	Do not use Orondis Opti following a soil application of another oxathiapiprolin product. No more than 2 sequential applications before rotating to another mode of action; 7-day minimum application interval. Applications of Orondis Opti should not exceed more than 33% of the total foliar fungicide applications, or 4 applications per crop, whichever is fewer. Limit on multiple crops is 6 applications per acre per year. Not labeled for greenhouse use.
Rhizopus rot	3 + 12	Chairman (propiconazole + fludioxonil)	32 fl oz/100 gal or /50,000 lb of fruit	-	-	-	Apply as a postharvest dip, drench, or high-volume spray for the postharvest control of certain rots. Lower rates for small diameter fruit. See label for details.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
Septoria leaf spot	M1	(copper compounds) Many brands available: Americop 40 DF, Badge SC, Badge X2, Basic Copper 50W HB, Basic Copper 53, Champ DP, Champ F2 FL, Champion WP, Champ WG, C-O-C DF, C-O-C-S WDG, C-O-C WP, Copper Count N, Cueva, Cuprofix Ultra 40D, Kentan DF, Kocide 2000, Kocide 3000, Kocide DF, Nordox, Nordox 75WG, Nu Cop 3L, Nu Cop 50DF, Nu Cop 50WP, Nu Cop HB, Previsto	SEE INDIVIDUAL LABELS		1	Varies by product from 4 hr to 2 days	
	M3	(mancozeb) Many brands available: Dithane DF, Dithane F45, Dithane M45, Koverall, Manzate FL, Manzate Pro-Stik, Penncozeb 4FL, Penncozeb 75DF, Penncozeb 80WP	SEE INDIVIDUAL LABELS		5		
	M3	Ziram 76DF Ziram XCEL (ziram)	4 lb	23.7 lb	7	2	Do not use on cherry tomatoes.
	M3 + M1	ManKocide (mancozeb + copper hydroxide)	5 lb	112 lb	5	2	
	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo Zn, Chloronil 720, Echo 720, Echo 90 DF, Echo Zn, Equus 500 Zn, Equus 720 SST, Equus DF, Initiate 720	SEE INDIVIDUAL LABELS		0	0.5	Use higher rates at fruit set and lower rates before fruit set.
	4 + M5	Ridomil Gold Bravo 76.4 W (chlorothalonil + mefenoxam)	3 lb	12 lb	14	2	Limit is 4 applications/crop.
	7	Fontelis (penthiopyrad)	24 fl oz	72 fl oz	0	0.5	No more than 2 sequential applications before switching to another effective fungicide with a different mode of action. See label for additional instructions pertaining to greenhouse usage.
	7	Luna Privilege (fluopyram)	6.84 fl oz	13.7 fl oz	0	0.5	No more than 2 sequential applications before switching to another effective fungicide with a different mode of action. See label for additional instructions pertaining to greenhouse usage.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	7 + 3	Aprovia Top (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz	0	0.5	No more than 2 sequential applications on a 7-day interval before rotating to a non-FRAC group 7 fungicide; subsequent applications on no shorter than a 14-day interval. Limit of 4 applications per a year. See label for surfactant precautions. Not labeled for greenhouse use.
	7 + 9	Luna Tranquility (fluopyram + pyrimethanil)	11.2 fl oz	54.7 fl oz	1	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. See label for additional instructions pertaining to greenhouse usage.
	7 + 11	Luna Sensation (fluopyram + trifloxystrobin)	7.6 fl oz	27.3 fl oz	3	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. Limit of 5 applications per a year.
	7 + 12	Miravis Prime (pydiflumetofen + fludioxonil)	11.4 fl oz	22.8 fl oz	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC group 7 or non-FRAC group 12 fungicide; no more than 2 applications at maximum rate per year; can be applied via chemigation in 0.1–0.25 inches/A of water. Not for use in transplant or greenhouse production.
	9 + 3	Inspire Super (cyprodinil + difenoconazole)	20 fl oz	47 fl oz	0	0.5	Limit is 5 applications per season with no more than 2 sequential applications. Must tank-mix or alternate with another effective fungicide from another FRAC group. Has up to an 8-month plant-back restriction with off-label crops.
	11	(azoxystrobin) Many brands available: AFrame, Arius, Azoxystar, Azoxystrobin 100ST, Azoxyzone, Azteroid FC, Dynasty, Gold Rush, Heritage, Mazolin, Quadris FL, Satori, Tetraban, Trevo, Willowood Azoxy 25C	SEE INDIVIDUAL LABELS		0	4 hr	Must alternate or tank-mix with a fungicide from a different FRAC group; see specific label for mixing instructions and precautions.
	11	Cabrio 2.09 F (pyraclostrobin)	16 fl oz	96 fl oz	0	0.5	Only 2 sequential applications allowed. Limit is 6 applications/crop. Must alternate or tank-mix with a fungicide from a different FRAC group.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	11	Flint (trifloxystrobin)	4 oz	16 oz	3	0.5	Limit is 5 applications/crop. Must alternate or tank-mix with a fungicide from a different FRAC group.
	11	Reason 500 SC (fenamidone)	8.2 oz	24.6 lb	14	0.5	Must alternate with a fungicide from a different FRAC group.
	11 + M3	Dexter Max (azoxystrobin + mancozeb)	1.6 lb	12 b	5	2	Limit is a single application before alternating to a non-FRAC group 11 fungicide.
	11 + M5	Quadris Opti (azoxystrobin + chlorothalonil)	1.6 pt	8 pt	0	0.5	Must alternate with a non-FRAC code 11 fungicide; use of an adjuvant may cause phytotoxicity.
	11 + 3	Topguard EQ (azoxystrobin + flutriafol)	8 fl oz	32 fl oz	0	0.5	Limit is 4 applications per season. Do not use adjuvants or EC formulated tank-mix partners. The addition of silicone- or oil-based additives may cause injury at high temperatures. Do not exceed 0.125% (v/v) adjuvant levels.
	11 + 3	Quadris Top (azoxystrobin + difenoconazole)	8 fl oz	47 fl oz	0	0.5	Limit is 4 applications per season with no more than 2 sequential applications. Must tank-mix or alternate with another effective fungicide from another FRAC group. Up to a 1-year plant-back restriction for certain off-label crops.
	11 + 7	Priaxor (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	Limit is 3 applications per season; no more than 2 sequential applications. See label about compatibility with other formulated products and adjuvants.
	11 + 27	Tanos (famoxadone + cymoxanil)	8 oz	72 oz	3	0.5	Do not alternate or tank-mix with other FRAC group 11 fungicides.
	22 + M3	Gavel 75DF (zoxamide + mancozeb)	2.0 lb	16 lb	5	2	
	27 + M5	Ariston Cymbol Advance (cymoxanil + chlorothalonil)	3.0 pt	17.5 pt	3	0.5	Check copper manufacturer's label for specific precautions and limitations for mixing with this product.
	40 + 3	Revus Top (mandipropamid + difenoconazole)	7 fl oz	28 fl oz	1	0.5	4 applications per season; no more than 2 sequential applications. Not labeled for transplants.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	49 + M5	Orondis Opti (oxathiapiprolin + chlorothalonil)	2.5 pt	10 pt	0	4 hr	Do not use Orondis Opti following a soil application of another oxathiapiprolin product. No more than 2 sequential applications before rotating to another mode of action; 7-day minimum application interval. Applications of Orondis Opti should not exceed more than 33% of the total foliar fungicide applications, or 4 applications per crop, whichever is fewer. Limit on multiple crops is 6 applications per acre per year. Not labeled for greenhouse use.
Sour rot (<i>Geotrichum candidum</i>)	3	Mentor (propiconazole)	8 oz/100 gal or /50,000 lb of fruit	-	-	-	Apply as a postharvest dip, drench, or high-volume spray for the postharvest control of certain rots. See label for details.
	3 + 12	Chairman (propiconazole + fludioxonil)	32 fl oz/100 gal or /50,000 lb of fruit	-	-	-	Apply as a postharvest dip, drench, or high-volume spray for the postharvest control of certain rots. Lower rates for small-diameter fruit. See label for details.
Southern blight	7	Fontelis (penthiopyrad)	1.0–1.6 fl oz/1000 row-ft	24 fl oz	0	0.5	Apply at-plant, preplant incorporated, in-furrow, as a transplant drench, or by drip irrigation.
(suppression)	7 + 3	Aprovia Top (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz	0	0.5	No more than 2 sequential applications on a 7-day interval before rotating to a non-FRAC group 7 fungicide; subsequent applications on no shorter than a 14-day interval. Limit of 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use.
	11	Aftershock Evito Tepera (fluoxastrobin)	5.7 fl oz Tepera: 12.6 fl oz	22.8 fl oz Tepera: 12.6 fl oz	3	0.5	Limit is 4 applications/crop. Must alternate or tank-mix with a fungicide from a different FRAC group.
(suppression)	11	Cabrio (pyraclostrobin)	16 oz	96 oz	0	0.5	Limit is 2 sequential applications before alternating to another effective fungicide from a different FRAC group.
(suppression)	11 + 7	Priaxor (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	Limit is 3 applications per season; no more than 2 sequential applications. See label about compatibility with other formulated products and adjuvants.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	14	Blocker 4F Terraclor 75 WP (PCNB)	SEE INDIVIDUAL LABELS		Soil treatment at planting	0.5	See label for application type and restrictions.
(suppression)	19	Oso 5% SC (polyoxin D zinc salt)	13 fl oz	78 fl oz	0	4 hr	Alternate with a non-FRAC code 19 fungicide.
Target spot	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo Zn, Chloronil 720, Echo 720, Echo 90 DF, Echo Zn, Equus 500 Zn, Equus 720 SST, Equus DF, Initiate 720	SEE INDIVIDUAL LABELS		0	0.5	Use higher rates at fruit set and lower rates before fruit set.
	3	Rhyme (flutriafol)	7 fl oz	28 fl oz	0	0.5	Limit is 4 applications per season.
	3 + 46	Regev (difenoconazole + tea tree oil)	8.5 fl oz	34 fl oz	2	0.5	Limit is 4 applications per year. No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group.
	4 + M5	Ridomil Gold Bravo 76.4 W (chlorothalonil + mefenoxam)	3 lb	12 lb	14	2	Limit is 4 applications/crop.
	7	Endura (boscalid)	12.5 oz	25 oz	0	0.5	Alternate with non-FRAC code 7 fungicides.
	7	Fontelis (penthiopyrad)	24 fl oz	72 fl oz	0	0.5	No more than 2 sequential applications before switching to another effective fungicide with a different mode of action. See label for additional instructions pertaining to greenhouse usage.
	7 + 3	Aprovia Top (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz	0	0.5	No more than 2 sequential applications on a 7-day interval before rotating to a non-FRAC group 7 fungicide; subsequent applications on no shorter than a 14-day interval. Limit of 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use.
	7 + 9	Luna Tranquility (fluopyram + pyrimethanil)	11.2 fl oz	54.7 fl oz	1	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. See label for additional instructions pertaining to greenhouse usage.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	7 + 11	Luna Sensation (fluopyram + trifloxystrobin)	7.6 fl oz	27.3 fl oz	3	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. Limit of 5 applications per a year.
	7 + 12	Miravis Prime (pydiflumetofen + fludioxonil)	11.4 fl oz	22.8 fl oz	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC group 7 or non-FRAC group 12 fungicide; no more than 2 applications at maximum rate per year; can be applied via chemigation in 0.1–0.25 inches/A of water. Not for use in transplant or greenhouse production.
	9	Scala SC (pyrimethanil)	7 fl oz	35 fl oz	1	0.5	Use only in a tank mix with another effective non-FRAC code 9 fungicide; has a 30-day plant-back with off-label crops.
	9 + 3	Inspire Super (cyprodinil + difenoconazole)	20 fl oz	47 fl oz	0	0.5	Limit is 5 applications/season with no more than 2 sequential applications. Must tank-mix or alternate with another effective fungicide from another FRAC group. Has up to an 8-month plant-back restriction with off-label crops.
	9 + 12	Alterity 62.5WG Switch 62.5WG (cyprodinil + fludioxonil)	14 oz	56 oz per year	0	0.5	See 2 (ee) label. After 2 applications alternate with non-FRAC code 9 or 12 fungicides for next 2 applications. Has a 30-day plant-back with off-label crops.
	11	Aftershock Evito Tepera (fluoxastrobil)	5.7 fl oz Tepera: 12.6 fl oz	22.8 fl oz Tepera: 12.6 fl oz	3	0.5	Limit is 4 applications/crop. Must alternate or tank-mix with a fungicide from a different FRAC group.
	11	(azoxystrobin) Many brands available: AFrame, Arius, AzoxyStar, Azoxystrobin 100ST, Azoxystrobin, Azteroid FC, Dynasty, Gold Rush, Heritage, Mazolin, Quadris FL, Satori, Tetraban, Trevo, Willowood Azoxy 25C	SEE INDIVIDUAL LABELS		0	4 hr	Must alternate or tank-mix with a fungicide from a different FRAC group; see specific label for mixing instructions and precautions.
	11	Cabrio 2.09 F (pyraclostrobin)	16 fl oz	96 fl oz	0	0.5	Only 2 sequential applications allowed. Limit is 6 applications/crop. Must alternate or tank-mix with a fungicide from a different FRAC group.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
	11 + M3	Dexter Max (azoxystrobin + mancozeb)	1.6 lb	12 lb	5	2	Limit is a single application before alternating to a non-FRAC group 11 fungicide.
	11 + M5	Quadris Opti (azoxystrobin + chlorothalonil)	1.6 pt	8 pt	0	0.5	Must alternate with a non-FRAC code 11 fungicide; use of an adjuvant may cause phytotoxicity.
	11 + 3	Quadris Top (azoxystrobin + difenoconazole)	8 fl oz	47 fl oz	0	0.5	Limit is 4 applications per season with no more than 2 sequential applications. Must tank-mix or alternate with another effective fungicide from another FRAC group. Has up to a 1-year plant-back restriction for certain off-label crops.
	11 + 3	Topguard EQ (azoxystrobin + flutriafol)	8 fl oz	32 fl oz	0	0.5	Limit is 4 applications per season. Do not use adjuvants or EC formulated tank-mix partners. The addition of silicone or oil based additives may cause injury at high temperatures. Do not exceed 0.125% (v/v) adjuvant levels.
	11 + 7	Priaxor (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	Limit is 3 applications per season; no more than 2 sequential applications. See label about compatibility with other formulated products and adjuvants.
	11 + 27	Tanos (famoxadone + cymoxanil)	8 oz	72 oz	3	0.5	Do not alternate or tank-mix with other FRAC group 11 fungicides.
	27 + M5	Ariston Cymbol Advance (cymoxanil + chlorothalonil)	3.0 pt	17.5 pt	3	0.5	Check copper manufacturer's label for specific precautions and limitations for mixing with this product.
	40 + 3	Revus Top (mandipropamid + difenoconazole)	7 fl oz	28 fl oz	1	0.5	4 applications per season; no more than 2 sequential applications. Not labeled for transplants.
	49 + M5	Orondis Opti (oxathiapiprolin + chlorothalonil)	2.5 pt	10 pt	0	4 hr	Do not use Orondis Opti following a soil application of another oxathiapiprolin product. No more than 2 sequential applications before rotating to another mode of action; 7-day minimum application interval. Applications of Orondis Opti should not exceed more than 33% of the total foliar fungicide applications, or 4 applications per crop, whichever is fewer. Limit on multiple crops is 6 applications per acre per year. Not labeled for greenhouse use.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Application	Season ²	Harvest	Reentry	
Timber rot, Sclerotinia stem rot, or white mold (<i>Sclerotinia sclerotiorum</i>) (suppression)	7 + 11	Luna Sensation (fluopyram + trifloxystrobin)	7.6 fl oz	27.3 fl oz	3	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. Limit of 5 applications per a year.
	11	(azoxystrobin) Many brands available: AFrame, Arius, Azoxystar, Azoxystrobin 100ST, Azoxyzone, Azteroid FC, Dynasty, Gold Rush, Heritage, Mazolin, Quadris FL, Satori, Tetraban, Trevo, Willowood Azoxy ZSC	SEE INDIVIDUAL LABELS		0	4 hr	Must alternate or tank-mix with a fungicide from a different FRAC group; see specific label for mixing instructions and precautions.
(suppression)	11	Cabrio 2.09 F (pyraclostrobin)	16 fl oz	96 fl oz	0	0.5	Only 2 sequential applications allowed. Limit is 6 applications/crop. Must alternate or tank-mix with a fungicide from a different FRAC group.
(suppression)	11 + 7	Priaxor (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	Limit is 3 applications per season; no more than 2 sequential applications. See label about compatibility with other formulated products and adjuvants.

¹ FRAC code (fungicide group): Number (1 through 46) and letters (U and P) are used to distinguish the fungicide mode of action groups. All fungicides within the same group (with same number or letter) indicate the same active ingredient or similar mode of action. This information must be considered for fungicide resistance management decisions. U = unknown, or a mode of action that has not been classified yet and is typically associated with another number; P = host plant defense inducers. Source: FRAC Code List 2021; <http://www.frac.info/> (FRAC = Fungicide Resistance Action Committee).

² Always double-check labels regarding maximum application limits. Many labels are changing from a maximum rate per a season (or crop cycle) to a maximum rate per a year.

³ Information provided in this table applies only to Florida. Be sure to read a current product label before applying any chemical. The use of brand names and any mention or listing of commercial products or services in the publication does not imply endorsement by UF/IFAS Extension nor discrimination against similar products or services not mentioned.

Table 6. Nonfumigant nematicides for tomatoes in Florida.

Product	Application Directions
Vydate L (a.i. oxamyl)	Apply 1/2 to 1 gal/acre at planting, preferably via drip application. Make additional applications on a 10-to-14-day interval. Do not apply more than 3 gal per acre per season. Minimum retreatment interval is 7 days unless a longer interval is stated. Do not make more than 8 applications per season.
Nimitz (a.i. fluensulfone)	All applications must be incorporated either physically or via drip or overhead irrigation. Make preplant applications at a rate of 3.5 to 7 pints (56.0 to 80.0 fl oz) per acre a minimum of seven days before planting. Do not plant any unlisted crops into treated land for 365 days after application of the product. Do not apply more than one application per crop, and no more than 112 fl oz of product per acre per year (365 days). Provides control only for nematodes. Growers applying Nimitz must consult the product label to observe the plant-back (recropping) intervals for a variety of leafy vegetables and brassica crops, onions, bananas, sugarcane, and other crops.
Velum (a.i. fluopyram)	Apply max 6.84 fl oz/acre using only chemigation into root-zone through low-pressure drip, trickle, microsprinkler or equivalent equipment. Observe minimum 7-day interval between soil applications. Do not apply more than 13.7 fl oz of Velum (0.446 lb fluopyram) per acre per year, regardless of formulation (Velum and/or Luna) or method of application (soil or foliar). For soil application, to limit the potential for development of disease resistance to this chemical class, the first foliar fungicide application after Velum should be a product from a different FRAC group.
Vydate is an insecticide/nematicide; Velum is a fungicide/nematicide; Nimitz is a true nematicide. Unlike fumigants, these products are not volatile and will move through the soil via water; depending on the water solubility, these products will have different recommendations as far as how to best apply them (see specific label recommendations); when nematode pressure is high, they may not be as consistently effective against root nematodes as the fumigants.	

Table 7. Fumigant nematicides for tomatoes in Florida.

Nematicide	Broadcast Application ¹		In-the-Row Applications
	Gallons or lb per Acre	fl oz/1000 ft/ chisel-spaced 12" apart	
Telone II ^{2,3}	27 to 35 gal	79 to 102	For any row spacing, application rates given may be concentrated in the row but shall never exceed the labeled maximum for broadcast applications. Consult the product label for additional detail.
Telone EC ^{2,3}		-	For drip fumigation, consult product label for proportionately reduced overall rates, drip concentration, and drip flow-modifying directions and procedures.
Telone C-17 ^{2,3}	32.4 to 42 gal	95 to 123	For any row spacing, application rates given may be concentrated in the row but shall never exceed the labeled maximum for broadcast applications. Consult the product label for additional detail.
Telone C-35 ^{2,3}	39 to 50 gal	114 to 146	For any row spacing, application rates given may be concentrated in the row but shall never exceed labeled maximum for broadcast applications. Consult the product label for additional detail.
Telone InLine ^{2,3}	29 to 56 gal	-	For drip fumigation, consult the product label for overall rate, drip concentration and flow-modifying application directions.
Pic Clor 60 ^{2,3}	19.5 to 31.5 gal	57 to 90	Consult product label for overall rate and chisel flow-modifying application directions.
Pic Clor 60 EC ^{2,3}	19.5 to 31.5 gal	-	For drip fumigation, consult product label for proportionately reduced overall rates, drip concentration, and drip flow-modifying directions and procedures.
Vapam HL	75 gal	-	For drip fumigation and crop termination, consult product label for proportionately reduced overall rates, drip concentration, and flow-modifying directions and procedures.
KPam HL	60 gal	-	For drip fumigation and crop termination, consult product label for proportionately reduced overall rates, drip concentration, and flow-modifying directions.
Allyl Isothiocyanate (AITC) Dominus	40 gal	-	For drip or in-row fumigation and crop termination, consult product label for overall rates, drip concentration, and flow-modifying directions

¹ Gallons/acre and fl oz/1000 feet provided only for mineral soils. Higher rates may be possible for heavier textured (loam, silt, clay) or highly organic soils.

² All of the fumigants mentioned are for retail sale and use only by state-certified applicators or persons under their direct supervision. New supplemental labeling for the Telone products must be in the hands of the user at the time of application. See label details for additional use restrictions based on soil characteristics, buffer zones, requirements for Personal Protective Equipment (PPE), mandatory good agricultural practices (GAPs), product and applicator training certification, and rate modifying recommendations with use of highly retentive Totally Impermeable mulch films (TIF).

³ Higher application rates are possible in the presence of cyst-forming nematodes.

Rates are believed to be correct for products named, and similar products of other brand names, when applied to mineral soils. Higher rates are required for muck (organic) soils. However, the **grower** has the final responsibility to see that each product is used legally; **read the label** of the product to be sure that you are using it properly.