

Chapter 18. Tomato Production¹

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Botany and Planting

Tomato—*Solanum lycopersicum*, Solanaceae

Table 1. Planting dates for tomato.

Planting Region	Dates
North Florida	July–Aug; Feb–Apr
West-central Florida	Aug–Sept; Jan–Feb
South Florida	Aug–Feb

Table 2. Planting information for tomato.

Planting Parameters	Measurements
Distance between rows (in)	48–72
Distance between plants (in)	18–32
Days to maturity	70–90
Plant population per acre	3,630–4,356

Cultivars

For more information on tomato varieties, see <https://ask.ifas.ufl.edu/topics/tomato>.

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. Fruit 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 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 have thick walls, very good external and internal color, and 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. Fruit 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. Fruit are very firm, have low gel, and have 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’. Widely adapted 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 fruit. 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 plant 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. Mature between 70 and 75 days. Good flavor, crack-resistant, and high Brix.

Table 3. Disease-resistance packages for tomato varieties.

	Varieties	Disease Resistance ¹
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, and 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 and 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 TYLC
	Skyway	R to F-R (1, 2); IR to N, TSW, and TYLC
	Southern Ripe	R to FCR, F-R (1, 2, 3), and TSW; IR to N
	STM2255	R to ASC, FCR, F-R (1, 2), and 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, and 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, and 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), and 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

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

The following tables list registered pesticides that should be integrated with other pest management methods. Additional information on integrated management methods can be requested from UF/IFAS Extension horticulture or agriculture agents. A list of local UF/IFAS Extension offices is available at <https://sfyl.ifas.ufl.edu/find-your-local-office/>.

Table 4. Herbicides approved for managing weeds in tomato. **Labels change frequently. Be sure to read a current product label before applying any chemical.**
Contact: Ramdas Kanissery, UF/IFAS Southwest Florida Research and Education Center.

	Active Ingredient lb a.i./Acre	Trade Name Product/Acre	MOA Code	Weeds Controlled/Remarks
PREPLANT/ PREEMERGENCE	Carfentrazone up to 0.031	(Aim) 2 EC up to 2 fl oz	14	Apply as a preplant burndown for emerged broadleaves up to 4 in. tall or rosettes less than 3 in. 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. Label is a 24(c) local indemnified label, and a waiver of liability must be signed for use. 14-day pretransplant interval.
	Flumioxazin up to 0.128	(Chateau EZ) up to 4 fl 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. PHI 70 days.
	Glufosinate-ammonium 0.53–0.79	(Rely) 280 29–43 fl oz	10	For burndown of emerged broadleaved weeds, grasses, and nutsedge prior to planting. May be applied as a pre-plant burndown to pre-formed beds covered with plastic mulch. See product label for planting intervals and other restrictions when applied prior to transplanting over the top of plastic mulch. Note: Rely 280 label is still valid for use if the applicator has product on hand. Registration has since moved to the Liberty label through December 2026 for row middle weed management in tomato. PHI 30 days.
	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	(Sandeia, Profine) 75 DF 0.5–1.0 oz	2	Broadleaf weeds and yellow/purple nutsedge. No more than 2 applications of halosulfuron per 12-month period. 7-day pretransplant interval. PHI 30 days.
	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. PHI 21 days.

	Active Ingredient lb a.i./Acre	Trade Name Product/Acre	MOA Code	Weeds Controlled/Remarks
	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. No more than 1 PRE and 1 POST application per growing season. 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 less than 1 in. tall. Apply preplant in transplanted tomatoes only. Incorporate to a depth of 2–4 in. No more than 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. PHI 7 days.
	Napropamide 1.0–2.0	(Devrinol DF-XT) 50 DF 2.0–4.0 lb (Devrinol 2-XT) 2–4 qt	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 (Gramoxone) 3 SL 1.3–2.7 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. No more than 3.0 pt/A per year. PHI 70 days.
	Pyraflufen ethyl 0.001–0.003	(ET Herbicide) 0.208 EC 0.5–252.0 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) 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. No more than 0.06 lb a.i./A per season. PHI 45 days.

	Active Ingredient lb a.i./Acre	Trade Name Product/Acre	MOA Code	Weeds Controlled/Remarks
	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. PHI 30 days. 90-day PHI if rate exceeds 1.33 pt/A.
	Sulfentrazone 0.070–0.19	(Spartan) 4F 2.25–6.0 oz	14	Preemergent control of broadleaves and grasses. Applications must be made prior to transplant. No more than 12 oz/A 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) 2 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. PHI 0 days.
	Clethodim 0.09–0.25 0.07–0.25	(Arrow) 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. PHI 20 days.
	Diquat 0.5	(Reglone Desiccant) 1 qt	22	Broadleaves and grasses. Apply to row middles only. No more than 2 applications per season. Prevent drift to crop. Nonionic surfactant recommended. PHI 30 days.
	Glufosinate-ammonium 0.53–1.17	(Rely) 280 29–62 fl oz	10	For postemergence control of broadleaved weeds, grasses, and nutsedge present between the rows of established tomatoes. Make a hooded application to row middles. PHI 30 days. Note: Rely 280 label is still valid for use if the applicator has product on hand. Registration has since moved to the Liberty label through December 2026 for row middle weed management in tomato.
	Halosulfuron 0.024–0.05	(Sandeia, 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. No more than 2 oz per 12-month period. Surfactant recommended. PHI 30 days.
	Imazosulfuron 0.19–0.3	(League) 4.0–6.4 oz	2	Apply postemergence 3–5 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. No more than 1 PRE and 1 POST application per growing season. Do not apply within 18 days of transplant. Surfactant recommended. PHI 30 days.

	Active Ingredient lb a.i./Acre	Trade Name Product/Acre	MOA Code	Weeds Controlled/Remarks
	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. Reapplications at least 14 days apart. No more than 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. PHI 7 days.
	Paraquat 0.5	(Gramoxone) 2 SL 2 pt (Gramoxone) 3 SL 1.3 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. No more than 3 applications per season. Nonionic surfactant recommended. PHI 30 days. Consult label for new restrictions.
	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. No more than 3.0 pt/A per year. PHI 70 days.
	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. No more than 0.06 lb a.i./A per 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. No more than 4.5 pt/A per season. Unsatisfactory results may occur if applied to grasses under stress. Crop oil concentrate recommended. PHI 20 days.
	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. PHI 90 days for rates above 1.33 pt/A. PHI 30 days for rates 1.33 pt/A 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. PHI 45 days.
POSTHARVEST	Diquat 0.5	(Reglone Desiccant) 2.0 pt	22	No more than 35 gal/A. Thorough coverage is required. Nonionic surfactant recommended.
	Paraquat 0.62–0.94	(Gramoxone) 2 SL 2.4–3.75 pt (Gramoxone) 3 SL 1.3–2.7 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. Consult label for new restrictions.

Table 5. Insecticides labeled for management of arthropod pests on tomato. **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.** Contact: Jawwad Qureshi, UF/IFAS Southwest Florida Research and Education Center.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
Aphids (including aphids-transmitting viruses, green peach aphid, potato aphid)	1A	*Lannate LV, *SP (methomyl)	LV: 1.5–3.0 pt SP: 0.5–1.0 lb	LV: 21 pt per crop (15 pt for tomatillos) SP: 7 lb per crop (5 lb for tomatillos)	48	1	–
	1A	*Vydate L (oxamyl)	Foliar: 2.0–4.0 pt	32 pt	48	3	–
	1B	Dimethoate 4 EC (dimethoate)	0.5–1.0 pt	1 lb a.i. per year	48	7	Reapplications at least 6 days apart.
	1B	Malathion 5 (malathion)	1.0–2.5 pt	10 pt	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	96 fl oz	12	1	–
	3A	*Baythroid XL (beta-cyfluthrin)	1.6–2.8 fl oz	16.8 fl oz	12	0	–
	3A	*Brigade 2EC (bifenthrin)	2.1–5.2 fl oz	20.8 fl oz	12	1	Reapplications at least 10 days apart. No more than 4 applications per season.
	3A	*Danitol 2.4 EC (fenpropathrin)	7–10.67 fl oz	42.67 fl oz	24	3	–
	3A	*Karate with Zeon (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz	24	5	–
	3A	*Mustang Maxx (zeta-cypermethrin)	3.2–4.0 oz	24 fl oz	12	1	Reapplications at least 7 days apart.
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	2.88 pt	24	5	–
	3A	Pyganic Crop Protection EC 5.0 II (pyrethrins)	4.5–18.0 fl oz	11.25 pt	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. OMRI-listed. ³ No more than 10 applications per season.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz	24	5	–
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	19.0 fl oz	24	5	See label for limits on each active ingredient.
	3A + 28	*Voliam Xpress (lambda-cyhalothrin + chlorantraniliprole)	5.0–9.0 fl oz	31.0 fl oz	24	5	–
	4A	Actara (thiamethoxam)	2.0–5.5 oz	11.0 oz	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. Reapplications at least 5 days apart.
	4A	Admire Pro (imidacloprid)	7–10.5 fl oz	10.5 fl oz	12	21	Application restrictions exist for this product because of the 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/1000 plants	–	12	Soil: 0	Greenhouse use: 1 application to mature plants, see label for cautions.
	4A	Admire Pro (imidacloprid)	0.44 fl oz/10,000 plants	–	12	21	Planthouse: 1 application. See label.
	4A	Assail 70WP (acetamiprid)	0.6–1.7 oz	6.8 oz of Assail 70WP, 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. No more than 4 applications per season. Reapplications at least 7 days apart.
	4A	Belay 50 WDG (clothianidin)	Foliar: 1.6–2.1 oz	6.4 oz	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	6.4 oz	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)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	4A	Platinum (thiamethoxam)	5–11 fl oz	11 fl oz	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	3.67 oz	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	Soil: 21 fl oz Foliar: 10.5 fl oz	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 1 method or the other.
	4A	Venom 20 SG (dinotefuran)	Foliar: 1–4 oz	1.34 lb	12	1	Toxic to honeybees.
	4A	Venom 20 SG (dinotefuran)	Soil: 5–7.5 oz	2.68 lb	12	21	–
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	13.0 fl oz	12	30	Several methods of soil application—see label.
	4A + 28	Voliam Flexi (thiamethoxam + chlorantraniliprole)	4.0–7.0 oz	14 oz	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	Transform WG (sulfoxaflor)	0.75–1.0 oz	8.5 oz	24	1	–
	4D	Sivanto Prime (flupyradifurone)	Soil: 21.0–28.0 fl oz Foliar: 7.0–14.0 fl oz	28.0 fl oz per year	4	Soil: 45 Foliar: 1	Reapplications at least 7 days apart.
	9B	Fulfill (pymetrozine)	2.75 oz	5.5 oz per crop	12	0	–

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	9B	PQZ (pyrifluquinazon)	2.4–3.2 fl oz	4.8 fl oz	12	1	Reapplications at least 7 days apart.
	9D	Sefina Inscalis Insecticide (afidopyropen)	3.0 fl oz	28 fl oz	12	0	Reapplications at least 7 days apart.
	21A	Torac (tolfenpyrad)	17–21 fl oz	42 fl oz per crop cycle	12	1	Do not apply until at least 14 days after emergence.
	23	Movento MPC (spirotetramat)	7.0–8.0 fl oz	16 fl oz	24	1	–
	28	Exirel (cyantraniliprole)	13.5–20.5 fl oz	0.4 lb a.i. 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. Reapplications at least 5 days apart.
	28	Verimark (cyantraniliprole)	Tray drench/ transplant water: 6.75–13.5 fl oz Drip: 6.75–10 fl oz	0.4 lb a.i.	4	1	–
	29	Beleaf 50 SG (flonicamid)	2.0–2.8 oz	8.4 oz	12	0	Begin applications before pests reach damaging levels. No more than 2 applications per season. Reapplications at least 7 days apart.
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	10 lb or 8 qt per crop	12	3	No more than 7 applications per season.
	1A	*Vydate L (oxamyl)	Foliar: 2.0–4.0 pt	32 pt	48	3	–
	3A	*Ambush 25W (permethrin)	3.2–12.8 oz	76.8 oz	12	Up to day of harvest	Do not use on cherry tomatoes.
	3A	*Asana XL (0.66EC) (esfenvalerate)	2.9–9.6 fl oz	96 fl oz	12	1	–
	3A	*Baythroid XL (beta-cyfluthrin)	1.6–2.8 fl oz	16.8 fl oz	12	0	–
	3A	*Brigade 2EC (bifenthrin)	2.1–5.2 fl oz	20.8 fl oz	12	1	Reapplications at least 10 days apart. No more than 4 applications per season.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	3A	*Hero (bifenthrin + zeta-cypermethrin)	4.0–10.3 oz	43.26 fl oz	12	1	No more than 4 applications per season. Reapplications at least 10 days apart.
	3A	*Karate with Zeon (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz	24	5	–
	3A	*Mustang Maxx (zeta-cypermethrin)	2.24–4.0 oz	24 fl oz	12	1	Reapplications at least 7 days apart.
	3A	*Pounce 25 WP (permethrin)	3.2–12.8 oz	0.6 lb a.i.	12	0	Do not apply to cherry or grape tomatoes (fruit with less than 1 in. diameter).
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	2.88 pt	24	5	–
	3A	Pyganic Crop Protection EC 5.0 II (pyrethrins)	4.5–18.0 fl oz	11.25 pt	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. OMRI-listed. ³ No more than 10 applications per season.
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz	24	5	–
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	19.0 fl oz	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	–
	4A	Actara (thiamethoxam)	2.0–5.5 oz	11.0 oz	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. Reapplications at least 5 days apart.
	4A	Admire Pro (imidacloprid)	7–10.5 fl oz	10.5 fl oz	12	21	Application restrictions exist for this product because of the risk to bees and other insect pollinators. Follow application restrictions found in directions for use to protect pollinators.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	4A	Assail 70WP (acetamiprid)	0.6–1.7 oz	6.8 oz of Assail 70WP, 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. No more than 4 applications per season. Reapplications at least 7 days apart.
	4A	Belay 50 WDG (clothianidin)	Foliar: 1.6–2.1 oz	6.4 oz	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	6.4 oz	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	11 fl oz	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	3.67 oz	–	–	–
	4A	Scorpion (dinotefuran)	Soil: 9–10.5 fl oz Foliar: 2–7 fl oz	Soil: 21 fl oz Foliar: 10.5 fl oz	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 1 method or the other.
	4A	Venom 20 SG (dinotefuran)	Foliar: 1–4 oz	1.34 lb	12	1	Toxic to honeybees.
	4A	Venom 20 SG (dinotefuran)	Soil: 5–7.5 oz	2.68 lb	12	21	–
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	13.0 fl oz	12	30	Several methods of soil application—see label.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	4A + 28	Voliam Flexi (thiamethoxam + chlorantraniliprole)	4.0–7.0 oz	14 oz	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	28.0 fl oz	4	1	Reapplications at least 7 days apart.
	5	Entrust (spinosad)	0.5–2.5 oz	9 oz per crop	4	1	OMRI-listed. ³ For thrips, rotate to other class of effective insecticide after 2 applications of a Group 5 insecticide for at least 2 applications.
	6	*Proclaim (emamectin benzoate)	2.4–4.8 oz	28.8 oz	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	36 fl oz	12	1	Reapplications at least 7 days apart.
	17	Trigard (cyromazine)	2.66 oz	15.96 oz	12	0	No more than 6 applications per crop. Does not control CPB adults. Most effective against 1st and 2nd instar larvae.
	21A	Torac (tolfenpyrad)	17–21 fl oz	42 fl oz	12	1	Do not apply until at least 14 days after emergence.
	28	Coragen (chlorantraniliprole)	3.5–7.5 fl oz	15.4 fl oz 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	0.4 lb a.i. 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. Reapplications at least 5 days apart.
	28	Verimark (cyantraniliprole)	Tray drench/ transplant water: 6.75–13.5 fl oz Drip: 6.75–10 fl oz	0.4 lb a.i. per crop	4	1	–

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
Caterpillars (including cabbage looper, corn earworm, garden webworm, hornworms, imported 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	10 lb or 8 qt per crop	12	3	No more than 7 applications per season.
	1A	10% Sevin Granules (carbaryl)	20 lb	–	12	3	No more than 4 applications per year. Reapplications at least 7 days apart.
	1B	*Diazinon AG500 *50W (diazinon)	AG500: 1–4 qt 50W: 2–8 lb	AG500: 4 qt 50W: 8 lb	48	preplant	Incorporate into soil—see label. No more than 1 soil application per year, regardless of target pest.
	3A	*Ambush 25W (permethrin)	3.2–12.8 oz	76.8 oz	12	Up to day of harvest	Do not use on cherry tomatoes.
	3A	*Asana XL (0.66EC) (esfenvalerate)	2.9–9.6 fl oz	96 fl oz	12	1	–
	3A	*Baythroid XL (beta-cyfluthrin)	1.6–2.8 fl oz	16.8 fl oz	12	0	–
	3A	*Brigade 2EC (bifenthrin)	2.1–5.2 fl oz	20.4 fl oz	12	1	Reapplications at least 10 days apart. No more than 4 applications per season.
	3A	*Danitol 2.4 EC (fenpropathrin)	–	–	24	3	–
	3A	*Hero (bifenthrin + zeta-cypermethrin)	4.0–10.3 oz	43.26 fl oz	12	1	No more than 4 applications per season. Reapplications at least 10 days apart.
	3A	*Karate with Zeon (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz	24	5	–
	3A	*Mustang Maxx (zeta-cypermethrin)	2.24–4.0 oz	24 fl oz	12	1	Reapplications at least 7 days apart. Consult label for specific species.
	3A	*Pounce 25 WP (permethrin)	3.2–12.8 oz	0.6 lb a.i.	12	0	Do not apply to cherry or grape tomatoes (fruit with less than 1 in. diameter).
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	2.88 pt	24	5	–

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	3A	Pyganic Crop Protection EC 5.0 II (pyrethrins)	4.5–18.0 fl oz	11.25 pt	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. OMRI-listed. ³ No more than 10 applications per season.
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz	24	5	–
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	19.0 fl oz	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 + 28	*Besiege (lambda-cyhalothrin + chlorantraniliprole)	5.0–9.0 fl oz	31 fl oz per year	24	5	–
	4A	Platinum (thiamethoxam)	5–11 fl oz	11 fl oz	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	3.67 oz	–	–	–
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	13.0 fl oz	12	30	Several methods of soil application—see label.
	4A + 28	Voliam Flexi (thiamethoxam + chlorantraniliprole)	4.0–7.0 oz	14 oz	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)	1.5–8.0 oz	9 oz per crop	4	1	OMRI-listed. ² 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)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	5	Radiant SC (spinetoram)	5–10 fl oz	34 fl oz per year	4	1	For thrips, if additional treatment is needed after 2 applications, switch to an alternate mode of action (not Group 5) for at least 2 applications.
	6	*Proclaim (emamectin benzoate)	2.4–4.8 oz	28.8 oz	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	20 fl oz 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. ³
	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. ³
	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. ³
	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. ³
	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. ³
	15	Rimon 0.83EC (novaluron)	9.0–12.0 fl oz	36 fl oz	12	1	Reapplications at least 7 days apart.
	18	Confirm 2F (tebufenozide)	6–16 fl oz	64 fl oz	4	7	Product is a slow-acting IGR (insect growth regulator) that will not kill larvae immediately.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	18	Intrepid 2F (methoxyfenozide)	4–16 fl oz	64 fl oz	4	1	Product is a slow-acting IGR that will not kill larvae immediately.
	22	Avaunt eVo (indoxacarb)	2.5–6.0 oz	24 oz per crop	12	3	Reapplications at least 5 days apart.
	28	Coragen (chlorantraniliprole)	3.5–7.5 fl oz	15.4 fl oz 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	0.4 lb a.i. 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. Reapplications at least 5 days apart.
	28	Verimark (cyantraniliprole)	5–13.5 fl oz	0.4 lb a.i. per crop	4	1	–
Fire ants	7A	Extinguish (S-methoprene)	1.0–1.5 lb	–	4	0	Slow-acting IGR.
	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	10 lb or 8 qt per crop	12	3	No more than 7 applications per season.
Leafhoppers	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 0.63–2.5 lb XLR, 4F: 0.5–2.0 qt	10 lb or 8 qt per crop	12	3	No more than 7 applications per season.
	1B	Dimethoate 4 EC (dimethoate)	0.5–1.0 pt	1 lb a.i. per year	48	7	Reapplications at least 6 days apart.
	3A	*Hero (bifenthrin + zeta-cypermethrin)	4.0–10.3 oz	43.26 fl oz	12	1	No more than 4 applications per season. Reapplications at least 10 days apart.
	3A	*Karate with Zeon (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz	24	5	–
	3A	*Mustang Maxx (zeta-cypermethrin)	2.24–4.0 oz	24 fl oz	12	1	Reapplications at least 7 days apart.
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	2.88 pt	24	5	–

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	3A	Pyganic Crop Protection EC 5.0 II (pyrethrins)	4.5–18.0 fl oz	11.25 pt	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. OMRI-listed. ³ No more than 10 applications per season.
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz	24	5	–
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	19.0 fl oz	24	5	See label for limits on each active ingredient.
	3A + 28	*Voliam Xpress (lambda-cyhalothrin + chlorantraniliprole)	5.0–9.0 fl oz	31.0 fl oz	24	5	–
	4A	Actara (thiamethoxam)	2.0–5.5 oz	11.0 fl oz	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. Reapplications at least 5 days apart.
	4A	Admire Pro (imidacloprid)	7–10.5 fl oz	10.5 fl oz	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	6.4 oz	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	6.4 oz	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	11 fl oz	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	3.67 oz	–	–	–

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	4A	Scorpion (dinotefuran)	Soil: 9–10.5 fl oz Foliar: 2–7 fl oz	Soil: 21 fl oz Foliar: 10.5 fl oz	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 1 method or the other.
	4A	Venom (dinotefuran)	Foliar: 1–4 oz	1.34 lb	12	1	Use only 1 application method (soil or foliar). No more than 3 applications per season. Toxic to honeybees.
	4A	Venom (dinotefuran)	Soil: 5–7.5 oz	2.68 lb	12	21	Use only 1 application method (soil or foliar).
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	13.0 fl oz	12	30	Several methods of soil application—see label.
	4A + 28	Voliam Flexi (thiamethoxam + chlorantraniliprole)	4.0–7.0 oz	14 oz	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	28.0 fl oz per year	4	Soil: 45 Foliar: 1	Reapplications at least 7 days apart.
	6	*Proclaim (emamectin benzoate)	2.4–4.8 oz	28.8 oz	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	27.2 fl oz 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. Reapplications at least 5 days apart.
	1A	*Vydate L (oxamyl)	Foliar: 2.0–4.0 pt	32 pt	48	3	–

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
<i>Liriomyza</i> leafminers	4A	Venom 20 SG (dinotefuran)	Foliar: 0.44–0.895 lb	1.34 lb	12	1	Use only 1 application method (soil or foliar). No more than 3 applications per season. Toxic to honeybees.
	4A	Venom 20 SG (dinotefuran)	Soil: 1.13–1.34 lb	2.68 lb	12	21	Use only 1 application method (soil or foliar). Must have supplemental label for rates over 6.0 oz/A.
	5	Entrust (spinosad)	6.0–10.0 oz	9 oz per crop	4	1	OMRI-listed. ³ 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	34 fl oz per year	4	1	–
	6	*Agri-Mek 0.15 EC (abamectin)	8.0–16.0 fl oz	48 fl oz	12	7	No more than 2 sequential applications per season.
	6	*Agri-Mek SC (abamectin)	1.75–3.5 fl oz	10.25 fl oz	12	7	No 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	20 fl oz 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	0.4 lb a.i. 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. Reapplications at least 5 days apart.
	28	Verimark (cyantraniliprole)	Tray drench/ transplant water: 6.75–13.5 fl oz Drip: 6.75–10 fl oz	0.4 lb a.i. per crop	4	1	Soil applied.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
Mites (including broad mites, twospotted spider mites, tomato russet mites, carmine spider mites)	1B	Malathion 5; 8F (malathion)	5: 1.0–2.5 pt 8F: 1.5 pt	10 pt	12	1	8F can be used in greenhouse.
	3A	*Brigade 2EC (bifenthrin)	2.1–5.2 fl oz	20.8 fl oz	12	1	Reapplications at least 10 days apart. No more than 4 applications per season.
	3A	*Danitol 2.4 EC (fenpropathrin)	7–10.67 fl oz	42.67 fl oz	24	3	–
	3A	*Hero (bifenthrin + zeta-cypermethrin)	4.0–10.3 oz	43.26 fl oz	12	1	No more than 4 applications per season. Reapplications at least 10 days apart.
	3A	*Karate with Zeon (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz	24	5	–
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	2.88 pt	24	5	–
	3A	Pyganic Crop Protection EC 5.0 II (pyrethrins)	4.5–18.0 fl oz	11.25 pt	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. OMRI-listed. ³ No more than 10 applications per season.
	6	*Agri-Mek 0.15 EC (abamectin)	8.0–16.0 fl oz	48 fl oz	12	7	No more than 2 sequential applications per season.
	6	*Agri-Mek SC (abamectin)	1.75–3.5 fl oz	10.25 fl oz	12	7	No 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	20 fl oz per year	24	7	This label contains pollinator warnings.
	20B	Kanemite 15 SC (acequinocyl)	31 fl oz	62 fl oz	12	1	Do not use less than 100 gal of water volume per acre. No more than 2 applications at least 21 days apart.
	20D	Acramite-50WS (bifenazate)	0.75–1.0 lb	–	12	3	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. No more than 1 application.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	21A	Magister (fenazaquin)	24–36 fl oz	36 fl oz	12	3	No more than 1 application per year.
	21A	Portal (fenpyroximate)	2.0 pt	4.0 pt per crop cycle	12	1	No more than 2 applications per growing season. Reapplications at least 14 days apart.
	23	Movento MPC (spirotetramat)	7.0–8.0 fl oz	16 fl oz	24	1	–
	23	Oberon 2SC (spiromesifen)	7.0–8.5 fl oz	25.5 fl oz per crop	12	1	No more than 3 applications per season.
Mole crickets	1B	*Diazinon AG500 *50 W (diazinon)	AG500: 1–4 qt 50W: 2–8 lb	AG500: 4 qt 50W: 8 lb	48	Preplant	Incorporate into soil—see label. No more than 1 soil application per season, regardless of target pest.
Plant bugs and tarnished plant bugs	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 0.63–2.5 lb XLR, 4F: 0.5–2.0 qt	10 lb or 8 qt	12	3	No more than 7 applications per season.
	3A	*Brigade 2EC (bifenthrin)	2.1–5.2 fl oz	20.8 fl oz	12	1	Reapplications at least 10 days apart. No more than 4 applications per season.
	3A	*Mustang Maxx (zeta-cypermethrin)	2.24–4.0 oz	24.0 fl oz	12	1	Reapplications at least 7 days apart.
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	2.88 pt	24	5	–
	3A	Pyganic Crop Protection EC 5.0 II (pyrethrins)	4.5–18.0 fl oz	11.25 pt	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. OMRI-listed. ³ No more than 10 applications per season.
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz	24	5	–
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	19.0 fl oz	24	5	See label for limits on each active ingredient.
	3A + 28	*Besiege (lambda-cyhalothrin + chlorantraniliprole)	5.0–9.0 fl oz	31 fl oz per year	24	5	–
	4A	Belay 50 WDG (clothianidin)	Foliar: 1.6–2.1 oz	6.4 oz	12	7	Do not use 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)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	4A	Belay 50 WDG (clothianidin)	Soil: 4.8–6.4 oz	6.4 oz	12	Apply at planting	See label for application instructions. Do not release irrigation water from the treated area.
	4C	Transform WG (sulfoxaflor)	1.5–2.25 oz	8.5 oz	24	1	–
	15	Rimon 0.83EC (novaluron)	9.0–12.0 fl oz	36 fl oz	12	1	Reapplications at least 7 days apart.
	29	Beleaf 50 SG (flonicamid)	2.0–2.8 oz	8.4 oz	12	0	Begin applications before pests reach damaging levels. No more than 2 applications per season. Reapplications at least 7 days apart.
Planthoppers	16	Courier 40SC (buprofezin)	9.0–13.6 fl oz	27.2 fl oz 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. Reapplications at least 5 days apart.
Psyllids	4D	Sivanto Prime (flupyradifurone)	7.0–14.0 fl oz	28.0 fl oz per year	4	1	Reapplications at least 7 days apart.
	23	Movento MPC (spirotetramat)	7.0–8.0 fl oz	16 fl oz	24	1	–
Stink bugs (including brown stink bug and green stink bug)	1A	10% Sevin Granules (carbaryl)	20 lb	–	12	3	No more than 4 applications per year. Reapplications at least 7 days apart.
	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 0.63–2.5 lb XLR, 4F: 0.5–2.0 qt	10 lb or 8 qt per crop	12	3	No more than 7 applications per season
	3A	*Baythroid XL (beta-cyfluthrin)	1.6–2.8 fl oz	16.8 fl oz	12	0	–
	3A	*Brigade 2EC (bifenthrin)	2.1–5.2 fl oz	20.8 fl oz	12	1	Reapplications at least 10 days apart. No more than 4 applications per season.
	3A	*Danitol 2.4 EC (fenpropathrin)	7–10.67 fl oz	42.67 fl oz	24	3	–
	3A	*Hero (bifenthrin + zeta-cypermethrin)	4.0–10.3 oz	43.26 fl oz	12	1	No more than 4 applications per season. Reapplications at least 10 days apart.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	3A	*Karate with Zeon (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz	24	5	–
	3A	*Mustang Maxx (zeta-cypermethrin)	3.2–4.3 oz	24.0 fl oz	12	1	Not recommended for vegetable leafminer in Florida. Reapplications at least 7 days apart.
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	2.88 pt	24	5	–
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz	24	5	–
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	19.0 fl oz	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 + 28	*Voliam Xpress (lambda-cyhalothrin + chlorantraniliprole)	5.0–9.0 fl oz	31.0 fl oz	24	5	–
	4A	Actara (thiamethoxam)	2.0–5.5 oz	11.0 oz	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. Reapplications at least 5 days apart.
	4A	Belay 50 WDG (clothianidin)	Foliar: 1.6–2.1 oz	6.4 oz	12	7	Do not use an adjuvant. Toxic to bees. Do not release irrigation water from the treated area.
	4A	Scorpion (dinotefuran)	Soil: 9–10.5 fl oz Foliar: 2–7 fl oz	Soil: 21 fl oz Foliar: 10.5 fl oz	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 1 method or the other.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	4A + 28	Voliam Flexi (thiamethoxam + chlorantraniliprole)	4.0–7.0 oz	14 oz	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	36 fl oz	12	1	Reapplications at least 7 days apart.
Thrips: check label for species controlled (includes melon thrips, western flower thrips, Florida flower thrips, eastern flower thrips, foliar feeding thrips, chilli thrips)	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 0.63–2.5 lb XLR, 4F: 0.5–2.0 qt	10 lb or 8 qt per crop	12	3	No more than 7 applications per season.
	3A	*Baythroid XL (beta-cyfluthrin)	1.6–2.8 fl oz	16.8 fl oz	12	0	–
	3A	*Brigade 2EC (bifenthrin)	2.1–5.2 fl oz	20.8 fl oz	12	1	Reapplications at least 10 days apart. No more than 4 applications per season.
	3A	*Hero (bifenthrin + zeta-cypermethrin)	10.3 oz	43.26 fl oz	12	1	No more than 4 applications per season. Reapplications at least 10 days apart.
	3A	*Karate with Zeon (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz	24	5	–
	3A	*Mustang (zeta-cypermethrin)	3.4–4.3 oz	25.8 fl oz	12	1	Reapplications at least 7 days apart.
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	2.88 pt	24	5	–
	3A	Pyganic Crop Protection EC 5.0 II (pyrethrins)	4.5–18.0 fl oz	11.25 pt	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. OMRI-listed. ³ No more than 10 applications per season.
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz	24	5	–
	3A + 4A	*Leverage 360 (beta-cyfluthrin + imidacloprid)	3.8–4.1 fl oz	–	12	0	–
	3A + 28	*Voliam Xpress (lambda-cyhalothrin + chlorantraniliprole)	5.0–9.0 fl oz	31.0 fl oz	24	5	–

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	4A	Admire Pro (imidacloprid)	7–10.5 fl oz	10.5 fl oz	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	6.8 oz of Assail 70WP including any pretransplant applications of acetamiprid	12	7	Do not apply to crop that has been already treated with imidacloprid or thiamethoxam at planting. No more than 4 applications per season. Reapplications at least 7 days apart.
	4A	Platinum (thiamethoxam)	5–11 fl oz	11 fl oz	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	3.67 oz	–	–	–
	4A	Scorpion (dinotefuran)	Soil: 9–10.5 fl oz Foliar: 2–7 fl oz	Soil: 21 fl oz Foliar: 10.5 fl oz	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 1 method or the other.
	4A	Venom 20 SG (dinotefuran)	Foliar: 1–4 oz	1.34 lb	12	1	Use only 1 application method (soil or foliar). No more than 3 applications per season. Toxic to honeybees.
	4A	Venom 20 SG (dinotefuran)	Soil: 5–7.5 oz	2.68 lb	12	21	Use only 1 application method (soil or foliar). Must have supplemental label for rates over 6.0 oz/A.
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	13.0 fl oz	12	30	Several methods of soil application—see label.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	4C	Transform WG (sulfoxaflor)	2.25 oz	8.5 oz	24	1	–
	5	Entrust (spinosad)	4–8 oz	8 oz per crop	4	1	OMRI-listed. ³ 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	34 fl oz per year	4	1	For thrips, if additional treatment is needed after 2 applications, switch to an alternate mode of action (not group 5) for at least 2 applications.
	6	*Agri-Mek 0.15 EC (abamectin)	8.0–16.0 fl oz	48 fl oz	12	7	No more than 2 sequential applications per season.
	6	*Agri-Mek SC (abamectin)	1.75–3.5 fl oz	10.25 fl oz	12	7	No 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	20 fl oz per year	24	7	This label contains pollinator warnings.
	15	Rimon 0.83EC (novaluron)	9.0–12.0 fl oz	36 fl oz	12	1	Reapplications at least 7 days apart.
	21A	Torac (tolfenpyrad)	17–21 fl oz	42 fl oz per crop cycle	12	1	Do not apply until at least 14 days after emergence.
	23	Movement MPC (spirotetramat)	7.0–8.0 fl oz	16 fl oz	24	1	–
	28	Exirel (cyantraniliprole)	13.5–20.5 fl oz	0.4 lb a.i. 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. Reapplications at least 5 days apart.
	28	Verimark (cyantraniliprole)	10.0–13.5 fl oz	0.4 lb a.i. per crop	4	1	–
	29	Beleaf 50 SG (flonicamid)	4.2 oz	8.4 oz		0	Begin applications before pests reach damaging levels. No more than 2 applications per season. Reapplications at least 7 days apart.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
Weevils (vegetable weevil)	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	2.88 pt	24	5	–
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz	24	5	See label for limits on each active ingredient.
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	19.0 fl oz	24	5	Antifeedant, repellent, IGR. OMRI-listed. ³
Whiteflies	1A	*Vydate L (oxamyl)	Foliar: 2.0–4.0 pt	32 pt	48	3	–
	3A	*Asana XL (0.66EC) (esfenvalerate)	2.9–9.6 fl oz	96 fl oz	12	1	–
	3A	*Baythroid XL (beta-cyfluthrin)	1.6–2.8 fl oz	16.8 fl oz	12	0	–
	3A	*Brigade 2EC (bifenthrin)	2.1–5.2 fl oz	20.8 fl oz	12	1	No more than 4 applications per season.
	3A	*Danitol 2.4 EC (fenpropathrin)	7–10.67 fl oz	42.67 fl oz	24	3	No more than 4 applications per season. Reapplications at least 10 days apart.
	3A	*Hero (bifenthrin + zeta-cypermethrin)	10.3 oz	43.26 fl oz	12	1	–
	3A	*Karate with Zeon (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz	24	5	–
	3A	*Mustang Maxx (zeta-cypermethrin)	3.2–4.0 oz	24.0 fl oz	12	1	–
	3A	*Proaxis Insecticide (gamma-cyhalothrin)	1.92–3.84 fl oz	2.88 pt	24	5	–
	3A	Pyganic Crop Protection EC 5.0 II (pyrethrins)	4.5–18.0 fl oz	11.25 pt	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. OMRI-listed. ³ No more than 10 applications per season.
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz	24	5	–
	3A + 28	*Besiege (lambda-cyhalothrin + chlorantraniliprole)	5.0–9.0 fl oz	31.0 fl oz	24	5	Reapplications at least 10 days apart.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	4A	Actara (thiamethoxam)	2.0–5.5 oz	11.0 oz	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	10.5 fl oz	12	21	Greenhouse use: 1 application to mature plants, see label for cautions.
	4A	Admire Pro (imidacloprid)	0.6 fl oz/1000 plants	–	12	Soil: 0	Planthouse: 1 application. See label.
	4A	Admire Pro (imidacloprid)	0.44 fl oz/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. No more than 4 applications per season. Reapplications at least 7 days apart.
	4A	Assail 70WP (acetamiprid)	0.6–1.7 oz	6.8 oz of Assail 70WP, 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	6.4 oz	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	6.4 oz	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	11 fl oz	12	30	–
	4A	Platinum 75 SG (thiamethoxam)	1.66–3.67 oz	3.67oz	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)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	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	Soil: 21 fl oz Foliar: 10.5 fl oz	12	21	Use only 1 application method (soil or foliar). Toxic to honeybees.
	4A	Venom 20 SG (dinotefuran)	Foliar: 1–5 oz	1.34 lb	12	1	Use only 1 application method (soil or foliar).
	4A	Venom 20 SG (dinotefuran)	Soil: 5–7.5 oz	2.68 lb	12	21	Several methods of soil application—see label.
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	13.0 fl oz	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	Transform WG (sulfoxaflor)	2.0–2.25 oz	8.5 oz	24	1	–
	4D	Sivanto Prime (flupyradifurone)	Soil: 21.0–28.0 fl oz Foliar: 10.5–14.0 fl oz	28.0 fl oz per year	–	Soil: 45 Foliar: 1	–
	7C	Knack IGR (pyriproxyfen)	8–10 fl oz	20 fl oz	12	14	–
	9B	Fulfill (pymetrozine)	2.75 oz	5.5 oz per crop	12	0	–
	9B	PQZ (pyrifluquinazon)	2.3–3.2 fl oz	4.8 fl oz per crop cycle	12	1	–
	9D	Sefina Inscalis Insecticide (afidopyropen)	14.0 fl oz	28 fl oz	–	–	Reapplications at least 7 days apart.
	15	Rimon 0.83EC (novaluron)	9.0–12.0 fl oz	36 fl oz	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. Reapplications at least 5 days apart.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Max Rate/Acre		REI (Hours)	Days to Harvest	Remarks ³
			Appl.	Season ²			
	16	Courier 40SC (buprofezin)	9.0–13.6 fl oz	27.2 fl oz per crop cycle	12	1	No more than 2 applications per growing season. Reapplications at least 14 days apart.
	21A	Magister (fenazaquin)	24–36 fl oz	36 fl oz	12	3	No more than 1 application per year.
	21A	Portal (fenpyroximate)	2.0 pt	4.0 pt per crop cycle	12	1	–
	23	Movement MPC (spirotetramat)	7.0–8.0 fl oz	16 fl oz	24	1	No more than 2 applications per season.
	23	Oberon 2SC (spiromesifen)	7.0–8.5 fl oz	25.5 fl oz per crop	12	1	–
	28	Exirel (cyantraniliprole)	13.5–20.5 fl oz	0.4 lb a.i. 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. Reapplications at least 5 days apart.
	28	Verimark (cyantraniliprole)	Tray drench/ transplant water: 6.75–13.5 fl oz Drip: 6.75–10.0 fl oz	0.4 lb a.i.	4	1	–
	29	Beleaf 50 SG (flonicamid)	4.2 oz	8.4 oz	–	0	–
Wireworms	1B	*Diazinon AG500 *50 W (diazinon)	AG500: 1–4 qt 50W: 2–8 lb	AG500: 4 qt 50W: 8 lb	48	Preplant	No more than 1 soil application per season, regardless of target pest.

¹ Mode of Action (MOA) codes for plant pest insecticides from the Insecticide Resistance Action Committee (IRAC) Mode of Action Classification v. 11.1 January 2024. Number codes 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 the same number) indicate the same active ingredient or similar mode of action. This information must be considered for the insecticide resistance management decisions.

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

³ 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.

*Restricted use insecticide.

Table 6. Tomato fungicides ordered by disease and then FRAC group according to their mode of action. **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.** Contact: Gary E. Vallad, UF/IFAS Gulf Coast Research and Education Center.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	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 label	See individual label	5	1	–
	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 label	See individual label	1	Varies from 4 hr to 2 days	Mancozeb enhances the bactericidal effect of fixed copper compounds.
	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	–

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	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 label	See individual label	0	0.5	Use higher rates at fruit set and lower rates before fruit set.
	3	Cevya Provysol (mefentrifluconazole)	5 fl oz	15 fl oz	0	0.5	No more than 3 applications per year.
	3	Rhyme (flutriafol)	7 fl oz	28 fl oz	0	0.5	No more than 4 applications per season.
	3 + BM 01	Regev (difenoconazole + tea tree oil)	8.5 fl oz	34 fl oz	2	0.5	No more than 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	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. No more than 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use.
	7 + 3	Luna Flex (fluopyram + difenoconazole)	13.6 fl oz	27.2 fl oz	0	0.5	No more than 2 applications per year. No more than 2 sequential applications of any FRAC 7-containing fungicide before rotating with a fungicide from a different group.
	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. No more than 5 applications per year. Suppression.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	9 + 3	Inspire Super Vango ESQ (cyprodinil + difenoconazole)	20 fl oz	80 fl oz	0	0.5	No more than 2 sequential applications before switching to another effective fungicide from another 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 2SC	See individual label	See individual label	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	No more than 5 applications per 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	No more than 1 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	No more than 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	No more than 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 Everlon Republic (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	No more than 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
			Appl.	Season ²	Harvest	Reentry	
	11 + 3	Veltyma (pyraclostrobin + mefentrifluconazole)	10 fl oz	30 fl oz	0	0.5	No more than 3 applications per year.
	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	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.
	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	RevusTop (mandipropamid + difenoconazole)	7 fl oz	28 fl oz	1	0.5	No more than 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 label	See individual label	1	Varies by product from 4 hr to 2 days	Mancozeb enhances the bactericidal effect of fixed copper compounds.
	3 + BM 01	Regev (difenoconazole + tea tree oil)	8.5 fl oz	34 fl oz	2	0.5	–
	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.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	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 label	See individual label	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 label	See individual label	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 + BM 01	Regev (difenoconazole + tea tree oil)	8.5 fl oz	34 fl oz	2	0.5	No more than 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. No more than 1 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. Suppression.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	25	Agri-mycin 17 Agri-mycin 50 FireWall 17 FireWall 50 (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 1 week of transplanting or emergence. No more than 8 weekly, sequential applications.
Bacterial wilt (<i>Ralstonia solanacearum</i>)	3 + BM 01	Regev (difenoconazole + tea tree oil)	8.5 fl oz	34 fl oz	2	0.5	No more than 4 applications per year. No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group.
Black mold (<i>Alternaria</i> spp.)	3	Cevya Provysol (mefentrifluconazole)	5 fl oz	15 fl oz	0	0.5	No more than 3 applications per year.
	3	Mentor (propiconazole)	8 oz/100 gal or 8 oz/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	No more than 4 applications per season.
	3 + BM 01	Regev (difenoconazole + tea tree oil)	8.5 fl oz	34 fl oz	2	0.5	No more than 4 applications per year. No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group.
	3 + 12	Chairman (propiconazole + fludioxonil)	32 fl oz/100 gal or 32 fl oz/ 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; 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.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	7	Tesaris (fluxapyroxad)	4.6 fl oz	13.8 fl oz	0	0.5	No more than 3 applications per year. No more than 2 sequential applications before rotating to a non FRAC-7 fungicide. See label regarding tank mixture restrictions.
	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. No more than 4 applications per a year. See label for surfactant precautions. Not labeled for greenhouse use.
	7 + 3	Luna Flex (fluopyram + difenoconazole)	13.6 fl oz	27.2 fl oz	0	0.5	No more than 2 applications per year. No more than 2 sequential applications of any FRAC 7-containing fungicide before rotating with a fungicide from a different group.
	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. No more than 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 per year. Can be applied via chemigation in 0.1–0.25 in./A of water. Not for use in transplant or greenhouse production.
	9 + 3	Inspire Super Vango ESQ (cyprodinil + difenoconazole)	20 fl oz	80 fl oz	0	0.5	No more than 2 sequential applications before switching to another effective fungicide from another FRAC group.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	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, Tetraban, Trevo, Willowood Azoxy 2SC	See individual label	See individual label	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	No more than 1 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	No more than 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	No more than 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	Veltyma (pyraclostrobin + mefentrifluconazole)	10 fl oz	30 fl oz	0	0.5	No more than 3 applications per year.
	11 + 7	Priaxor Everlon Republic (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	No more than 3 applications per season. No more than 2 sequential applications. See label about compatibility with other formulated products and adjuvants.
	12	Scholar SC (fludioxonil)	32 fl oz/100 gal or 16 fl oz/50,000 lb of fruit	32 fl oz/100 gal or 16 fl oz/50,000 lb of fruit	0	0	Apply as a postharvest dip, drench, or high-volume spray for the postharvest control of fruit rots. Must be used in tank mixture with propiconazole. Not for processed tomato.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	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. No more than 1 application per year. Foliar suppression only.
	40 + 3	Revus Top (mandipropamid + difenoconazole)	7 fl oz	28 fl oz	1	0.5	No more than 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. Reapplications at least 7 days apart. 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 label	See individual label	0	0.5	Use higher rates at fruit set and lower rates before fruit set.
	3 + 12	Chairman (propiconazole + fludioxonil)	32 fl oz/100 gal or 32 fl oz/ 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. Suppression.
	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
			Appl.	Season ²	Harvest	Reentry	
	7 + 3	Luna Flex (fluopyram + difenoconazole)	13.6 fl oz	27.2 fl oz	0	0.5	No more than 2 applications per year. No more than 2 sequential applications of any FRAC 7-containing fungicide before rotating with a fungicide from a different group.
	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. No more than 5 applications per a year.
	7 + 11	Priaxor Everlon Republic (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	No more than 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 per year. Can be applied via chemigation in 0.1–0.25 in./A of water. Not for use in transplant or greenhouse production. Suppression.
	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
			Appl.	Season ²	Harvest	Reentry	
	11	Cabrio 2.09 F (pyraclostrobin)	16 fl oz	96 fl oz	0	0.5	No more than 2 sequential applications allowed. No more than 6 applications per crop. Must alternate or tank-mix with a fungicide from a different FRAC group. Suppression.
	12	Scholar SC (fludioxonil)	32 fl oz/100 gal or 16 fl oz/ 50,000 lb of fruit	32 fl oz/100 gal or 16 fl oz/ 50,000 lb of fruit	0	0	Apply as a postharvest dip, drench, or high-volume spray for the postharvest control of fruit rots. Must be used in tank mixture with propiconazole. Not for processed tomato.
	12	Spirato 480 FS Spirato GHN (fludioxonil)	7 fl oz	28 fl oz	0	0.5	For use in greenhouse and other enclosed structures only. No more than 4 applications per year. No more than 2 sequential applications before rotating to a different mode of action for 2 applications.
	17	Decree 50 WDG (fenhexamid)	1.5 lb	6 lb	0	0.5	Transplant and greenhouse use only. No 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. Reapplications at least 7 days apart. 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	M1 + 4	Ridomil Gold Copper (copper hydroxide + mefenoxam)	2 lb	6 lb	14	2	No more than 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
			Appl.	Season ²	Harvest	Reentry	
Phytophthora fruit rot (<i>Phytophthora</i> spp.)	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 2SC	See individual label	See individual label	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	No more than 2 sequential applications allowed. No more than 6 applications per 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	No more than 1 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 + 27	Tanos (famoxadone + cymoxanil)	8 oz	72 oz	3	0.5	Do not alternate or tank-mix with other FRAC group 11 fungicides. Suppression.
	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. Reapplications at least 7 days apart. 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
			Appl.	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. Reapplications at least 7 days apart. 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 label	See individual label	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 label	See individual label	5	1	–
	M3	Ziram Granuflo Ziram 76DF Ziram XCEL (ziram)	4 lb	23.7 lb	7	2	Do not use on cherry tomatoes.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	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 label	See individual label	0	0.5	Use higher rates at fruit set and lower rates before fruit set.
	3	Cevya Provysol (mefentrifluconazole)	5 fl oz	15 fl oz	0	0.5	No more than 3 applications per year.
	3	Rhyme (flutriafol)	7 fl oz	28 fl oz	0	0.5	No more than 4 applications per season.
	3	Tebucon 3.6F TebuStar 3.6L Tebuzol 3.6F Toledo 3.6F (tebuconazole)	8 fl oz	48 fl oz	7	0.5	No more than 6 applications per crop. Reapplications at least 7 days apart.
	3 + BM 01	Regev (difenoconazole + tea tree oil)	8.5 fl oz	34 fl oz	2	0.5	No more than 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	No more than 4 applications per 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	Tesaris (fluxapyroxad)	4.6 fl oz	13.8 fl oz	0	0.5	No more than 3 applications per year. No more than 2 sequential applications before rotating to a non FRAC-7 fungicide. See label regarding tank mixture restrictions.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	7	Velum (fluopyram)	6.84 fl oz	13.7 fl oz	0	0.5	For soil application only. No more than 2 applications per year. The first foliar fungicide application following Velum 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. No more than 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use.
	7 + 3	Luna Flex (fluopyram + difenoconazole)	13.6 fl oz	27.2 fl oz	0	0.5	No more than 2 applications per year. No more than 2 sequential applications of any FRAC 7-containing fungicide before rotating with a fungicide from a different group.
	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. No more than 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 per year. Can be applied via chemigation in 0.1–0.25 in./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.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	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	No more than 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	No more than 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	Veltyma (pyraclostrobin + mefentrifluconazole)	10 fl oz	30 fl oz	0	0.5	No more than 3 applications per year.
	11 + 7	Priaxor Everlon Republic (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	No more than 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 Spirato 480SC (fludioxonil)	7 fl oz	28 fl oz	0	0.5	For use in greenhouse and other enclosed structures only. No more than 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.
	22 + M3	Gavel 75DF (zoxamide + mancozeb)	2.0 lb	16 lb	5	2	–
	22 + M5	Zing! (zoxamide + chlorothalonil)	36 fl oz	288 fl oz	5	0.5	No more than 8 applications per season. No more than 2 sequential applications before alternating to a different mode of action.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	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	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	No more than 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. Reapplications at least 7 days apart. 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.
Fusarium wilt (<i>Fusarium</i> spp.)	7	Velum (fluopyram)	6.84 fl oz	13.7 fl oz	0	0.5	For soil application only. No more than 2 applications per year. The first foliar fungicide application following Velum should be from a different FRAC group. Suppression.
	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.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	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 label	See individual label	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 label	See individual label	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 label	See individual label	0	0.5	Use higher rates at fruit set and lower rates before fruit set.
	3 + BM 01	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	No more than 4 applications per crop.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	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. No more than 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use.
	7 + 3	Luna Flex (fluopyram + difenoconazole)	13.6 fl oz	27.2 fl oz	0	0.5	No more than 2 applications per year. No more than 2 sequential applications of any FRAC 7-containing fungicide before rotating with a fungicide from a different group.
	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. No more than 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 per year. Can be applied via chemigation in 0.1–0.25 in./A of water. Not for use in transplant or greenhouse production.
	9 + 3	Inspire Super Vango ESQ (cyprodinil + difenoconazole)	20 fl oz	80 fl oz	0	0.5	No more than 2 sequential applications before switching to another effective fungicide from another 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	No more than 5 applications per 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	No more than 1 application before alternating to a non-FRAC group 11 fungicide.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	11 + 3	Quadris Top (azoxystrobin + difenoconazole)	8 fl oz	47 fl oz	0	0.5	No more than 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	No more than 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. Reapplications at least 7 days apart. 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
			Appl.	Season ²	Harvest	Reentry	
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 label	See individual label	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 label	See individual label	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 label	See individual label	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	No more than 3 applications per crop. Tank-mix with mancozeb fungicide.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	4 + M3	Ridomil Gold MZ (mefenoxam + mancozeb)	2.5 lb	7.5 lb	5	2	No more than 3 applications per crop.
	4 + M5	Ridomil Gold Bravo 76.4 W (chlorothalonil + mefenoxam)	3 lb	12 lb	14	2	No more than 4 applications per crop.
	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	No more than 4 applications per crop. Must alternate or tank-mix with a fungicide from a different FRAC group. Suppression.
	11 + IRAC 3	Tepera Plus (fluoxastrobin + bifenthrin)	15.4 fl oz	61.6 fl oz	3	0.5	Contains bifenthrin insecticide. No more than 4 applications per year. Reapplications at least 10 days apart. No use in greenhouse. Suppression.
	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 2SC	See individual label	See individual label	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	No more than 2 sequential applications allowed. No more than 6 applications per 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	No more than 5 applications per 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	No more than 1 application before alternating to a non-FRAC group 11 fungicide.
	11 + 3	Veltyma (pyraclostrobin + mefentrifluconazole)	10 fl oz	30 fl oz	0	0.5	No more than 3 applications per year.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	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 label	See individual label	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	No more than 3 applications per crop. Tank-mix with mancozeb fungicide.
	4 + M3	Ridomil Gold MZ (mefenoxam + mancozeb)	2.5 lb	7.5 lb	5	2	No more than 3 applications per crop.
	4 + M5	Ridomil Gold Bravo 76.4 W (chlorothalonil + mefenoxam)	3 lb	12 lb	14	2	No more than 4 applications per crop.
	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	No more than 4 applications per crop. Must alternate or tank-mix with a fungicide from a different FRAC group. Suppression.
	11 + IRAC 3	Tepera Plus (fluoxastrobin + bifenthrin)	15.4 fl oz	61.6 fl oz	3	0.5	Contains bifenthrin insecticide. No more than 4 applications per year. Reapplications at least 10 days apart. No use in greenhouse. Suppression.
	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 2SC	See individual label	See individual label	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	No more than 2 sequential applications allowed. No more than 6 applications per 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	No more than 5 applications per 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
			Appl.	Season ²	Harvest	Reentry	
	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	No more than 1 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	No more than 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 Everlon Republic (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	7	0.5	No more than 3 applications per season. No more than 2 sequential applications. See label about compatibility with other formulated products and adjuvants. 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.
	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.
	21	Ranman (cyazofamid)	2.75 oz	16 oz	0	0.5	No more than 6 applications per crop.
	22 + M3	Gavel 75DF (zoxamide + mancozeb)	2.0 lb	16 lb	5	2	–
	22 + M5	Zing! (zoxamide + chlorothalonil)	36 fl oz	288 fl oz	5	0.5	No more than 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.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	27 + 28	Cymbol Balance (cymoxanil + propamocarb hydrochloride)	21 fl oz	168 fl oz	5	0.5	No more than 8 applications per season.
	28	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	(mono- and dipotassium salts of phosphorous acid) Many brands available: Alude, Drexel Phiticide, Phostrol, Confine Extra, Fungi-Phite, Rampart 6.8, Reliant, Sparra, Fosphite, K-Phite	See individual label	See individual label	–	4 hr	see specific label for mixing instructions and precautions.
	40	Forum (dimethomorph)	6 oz	30 oz	4	0.5	No more than 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	No more than 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	2	0.5	No more than 4 applications per season. No more than 2 sequential applications. Spray reapplications at least 10 days apart. Tank-mix with another labeled non-FRAC code 43 fungicide; 18-month rotation with off-label crops; see label.
	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. No more than 3 applications per season.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	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. Reapplications at least 7 days apart. 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. Reapplications at least 7 days apart. 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 label	See individual label	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 label	See individual label	0	0.5	Use higher rates at fruit set and lower rates before fruit set.
	3 + BM 01	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
			Appl.	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. No more than 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use.
	7 + 3	Luna Flex (fluopyram + difenoconazole)	13.6 fl oz	27.2 fl oz	0	0.5	No more than 2 applications per year. No more than 2 sequential applications of any FRAC 7-containing fungicide before rotating with a fungicide from a different group.
	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 per year. Can be applied via chemigation in 0.1–0.25 in./A of water. Not for use in transplant or greenhouse production.
	9 + 3	Inspire Super Vango ESQ (cyprodinil + difenoconazole)	20 fl oz	80 fl oz	0	0.5	No more than 2 sequential applications before switching to another effective fungicide from another FRAC group.
	11 + M3	Dexter Max (azoxystrobin + mancozeb)	1.6 lb	12 lb	5	2	No more than 1 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	No more than 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.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	40 + 3	Revus Top (mandipropamid + difenoconazole)	7 fl oz	28 fl oz	1	0.5	No more than 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. Reapplications at least 7 days apart. 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 ReCon Bold SL Xyler FC (metalaxyl)	Metastar: 2 qt ReCon 4F: 2 qt ReCon SL: 1 pt Xyler: 2.9 qt	Metastar: 2 qt ReCon 4F: 6 qt ReCon SL: 3 pt Xyler: 4.3 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*	No more than 1.5 lb/A mefenoxam 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)
	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 individual label	See individual label	5	0.5	Greenhouse application: 6 applications per 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	30 lb	14	0.5	See label for warnings concerning the use of copper compounds.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	33	(mono- and dipotassium salts of phosphorous acid) Many brands available: Alude, Drexel Phiticide, Phostrol, Confine Extra, Fungi-Phite, Rampart 6.8, Reliant, Sparra, Fosphite, K-Phite	See individual label	See individual label	0	4 hr	See specific label for mixing instructions and precautions.
	43	Presidio (fluopicolide)	4 fl oz	12 fl oz	2	0.5	No more than 4 applications per season. No more than 2 sequential applications. Spray reapplications at least 10 days apart. 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. No more than 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. Reapplications at least 7 days apart. 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.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
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, Thiolux Jet, Thiosperse 80%, Wettable Sulfur, Wettable Sulfur 92, Yellow Jacket Dusting Sulfur, Yellow Jacket Wettable Sulfur	See individual label	See individual label	1	1	Follow label closely; may cause leaf burn if applied during high temperatures.
	3	Cevya Provysol (mefentrifluconazole)	5 fl oz	15 fl oz	0	0.5	No more than 3 applications per year.
	3	Rally 40WSP Sonoma 40WSP (myclobutanil)	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	No more than 4 applications per season.
	3	Terraguard SC Trionic 4SC (triflumizole)	4 fl oz/100 gal	16 fl oz	1	0.5	Greenhouse production only. No more than 4 applications per season.
	3 + BM 01	Regev (difenoconazole + tea tree oil)	8.5 fl oz	34 fl oz	2	0.5	No more than 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	Tesaris (fluxapyroxad)	4.6 fl oz	13.8 fl oz	0	0.5	No more than 3 applications per year. No more than 2 sequential applications before rotating to a non FRAC-7 fungicide. See label regarding tank mixture restrictions.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	7	Velum (fluopyram)	6.84 fl oz	13.7 fl oz	0	0.5	For soil application only. No more than 2 applications per year. The first foliar fungicide application following Velum 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. No more than 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use.
	7 + 3	Luna Flex (fluopyram + difenoconazole)	13.6 fl oz	27.2 fl oz	0	0.5	No more than 2 applications per year. No more than 2 sequential applications of any FRAC 7-containing fungicide before rotating with a fungicide from a different group.
	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. No more than 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 per year. Can be applied via chemigation in 0.1–0.25 in./A of water. Not for use in transplant or greenhouse production.
	9	Vango (cyprodinil)	7 oz	28 oz	0	0.5	No more than 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 Vango ESQ (cyprodinil + difenoconazole)	20 fl oz	80 fl oz	0	0.5	No more than 2 sequential applications before switching to another effective fungicide from another FRAC group.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	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 2SC	See individual label	See individual label	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	No more than 2 sequential applications allowed. No more than 6 applications per 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	No more than 5 applications per 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	No more than 1 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	No more than 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.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	11 + 3	Topguard EQ (azoxystrobin + flutriafol)	8 fl oz	32 fl oz	0	0.5	No more than 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	Veltyma (pyraclostrobin + mefentrifluconazole)	10 fl oz	30 fl oz	0	0.5	No more than 3 applications per year.
	11 + 7	Priaxor Everlon Republic (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	No more than 3 applications per season. No more than 2 sequential applications. See label about compatibility with other formulated products and adjuvants.
	12	Spirato GHN Spirato 480SC (fludioxonil)	7 fl oz	28 fl oz	0	0.5	For use in greenhouse and other enclosed structures only. No more than 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.
	39	Torac (tolfenpyrad)	21 fl oz	42 fl oz	1	0.5	Primarily an insecticide. No more than 2 applications per season. No more than 4 applications per year. Reapplications at least 14 days apart. Suppression.
	40 + 3	Revus Top (mandipropamid + difenoconazole)	7 fl oz	28 fl oz	1	0.5	No more than 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. No more than 4 applications per year.
	50	Vivando (metrafenone)	15.4 fl oz	46.2 fl oz	0	0.5	No more than 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	No more than 3 applications per season. Reapplications at least 14 days apart.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	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*	No more than 1.5 lb/A mefenoxam per crop to the soil. *There is a reentry interval exemption if material is soil-injected or soil-incorporated.
	4	Metastar 2E ReCon 4F ReCon Bold SL (metalaxyl)	Megastar: 4 qt ReCon 4F: 2 qt ReCon SL: 1 pt	Metastar: 6 qt ReCon 4F: 3 qt ReCon SL: 1 pt	2	28	Must be soil applied. See labels.
	21	Ranman Segway O (cyazofamid)	3 fl oz/100 gal	–	0	–	Greenhouse transplant production only; make a single application to the seedling tray 1 week prior to the time of transplanting. Do not use any surfactant.
	28	Previcur Flex (propamocarb hydrochloride)	See individual label	See individual label	5	0.5	Greenhouse application: 6 applications per crop cycle. Do not mix with other products. Can cause phytotoxicity if applied in intense sunlight.
	28	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	(mono- and dipotassium salts of phosphorous acid) Many brands available: Alude, Drexel Phiticide, Phostrol, Confine Extra, Fungi-Phite, Rampart 6.8, Reliant, Sparra, Fosphite, K-Phite	See individual label	See individual label	–	4 hr	See specific label for mixing instructions and precautions.
	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.
	U17	Vayantis (picarbutrazox)	0.384 fl oz/100 lb seed	–	–	–	Seed treatment only.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
Rhizoctonia root rot Rhizoctonia fruit rot Rhizoctonia stem rot <i>(Rhizoctonia solani)</i>	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 label	See individual label	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.
	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. No more than 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use.
	11	Cabrio (pyraclostrobin)	16 oz	96 oz	0	0.5	No more than 2 sequential applications before alternating to another effective fungicide from a different FRAC group. Suppression.
	11 + 3	Veltyrna (pyraclostrobin + mefentrifluconazole)	10 fl oz	30 fl oz	0	0.5	No more than 3 applications per year.
	11 + 7	Priaxor Everlon Republic (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	7	0.5	No more than 3 applications per season. No more than 2 sequential applications. See label about compatibility with other formulated products and adjuvants. 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.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	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. Reapplications at least 7 days apart. 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 32 fl oz/ 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.
	12	Scholar SC (fludioxonil)	32 fl oz/100 gal or 16 fl oz/ 50,000 lb of fruit	32 fl oz/100 gal or 16 fl oz/ 50,000 lb of fruit	0	0	Apply as a postharvest dip, drench, or high-volume spray for the postharvest control of fruit rots. Must be used in tank mixture with propiconazole. Not for processed tomato.
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 label	See individual label	1	Varies by product from 4 hr to 2 days	–

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	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 label	See individual label	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 label	See individual label	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	No more than 4 applications per 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	Velum (fluopyram)	6.84 fl oz	13.7 fl oz	0	0.5	For soil application only. No more than 2 applications per year. The first foliar fungicide application following Velum should be from a different FRAC group.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	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. No more than 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use.
	7 + 3	Luna Flex (fluopyram + difenoconazole)	13.6 fl oz	27.2 fl oz	0	0.5	No more than 2 applications per year. No more than 2 sequential applications of any FRAC 7-containing fungicide before rotating with a fungicide from a different group.
	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. No more than 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 per year. Can be applied via chemigation in 0.1–0.25 in./A of water. Not for use in transplant or greenhouse production.
	9 + 3	Inspire Super Vango ESQ (cyprodinil + difenoconazole)	20 fl oz	80 fl oz	0	0.5	No more than 2 sequential applications before switching to another effective fungicide from another 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 2SC	See individual label	See individual label	0	4 hr	Must alternate or tank-mix with a fungicide from a different FRAC group; see specific label for mixing instructions and precautions.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	11	Cabrio 2.09 F (pyraclostrobin)	16 fl oz	96 fl oz	0	0.5	No more than 2 sequential applications allowed. No more than 6 applications per crop. Must alternate or tank-mix with a fungicide from a different FRAC group.
	11	Flint (trifloxystrobin)	4 oz	16 oz	3	0.5	No more than 5 applications per 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	No more than 1 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	No more than 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	No more than 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 + 3	Veltyma (pyraclostrobin + mefentrifluconazole)	10 fl oz	30 fl oz	0	0.5	No more than 3 applications per year.
	11 + 7	Priaxor Everlon Republic (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	No more than 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	–

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	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	No more than 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. Reapplications at least 7 days apart. 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 8 oz/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 32 oz/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.
	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. No more than 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use. 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	No more than 4 applications per 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
			Appl.	Season ²	Harvest	Reentry	
	11	Cabrio (pyraclostrobin)	16 oz	96 oz	0	0.5	No more than 2 sequential applications before alternating to another effective fungicide from a different FRAC group. Suppression.
	11 + IRAC 3	Tepera Plus (fluoxastrobin + bifenthrin)	15.4 fl oz	61.6 fl oz	3	0.5	Contains bifenthrin insecticide. No more than 4 applications per year. Reapplications at least 10 days apart. No use in greenhouse.
	11 + 3	Veltyma (pyraclostrobin + mefentrifluconazole)	10 fl oz	30 fl oz	0	0.5	No more than 3 applications per year.
	11 + 7	Priaxor Everlon Republic (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	No more than 3 applications per season. No more than 2 sequential applications. See label about compatibility with other formulated products and adjuvants. 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. Suppression.
	29	Omega 500F Orbus 4F (fluazinam)	24 fl oz	144 fl oz	7	0.5	Apply at or within the day of transplant as a soil directed spray, irrigate within 1 hour of application. No more than 6 foliar applications at 7- to 14-day intervals.
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 label	See individual label	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	No more than 4 applications per season.
	3 + BM 01	Regev (difenoconazole + tea tree oil)	8.5 fl oz	34 fl oz	2	0.5	No more than 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	No more than 4 applications per crop.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	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. No more than 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use.
	7 + 3	Luna Flex (fluopyram + difenoconazole)	13.6 fl oz	27.2 fl oz	0	0.5	No more than 2 applications per year. No more than 2 sequential applications of any FRAC 7-containing fungicide before rotating with a fungicide from a different group.
	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. No more than 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 per year. Can be applied via chemigation in 0.1–0.25 in./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 Vango ESQ (cyprodinil + difenoconazole)	20 fl oz	80 fl oz	0	0.5	No more than 2 sequential applications before switching to another effective fungicide from another FRAC group.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	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	No more than 4 applications per 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 2SC	See individual label	See individual label	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	No more than 2 sequential applications allowed. No more than 6 applications per crop. Must alternate or tank-mix with a fungicide from a different FRAC group.
	11 + IRAC 3	Tepera Plus (fluoxastrobin + bifenthrin)	15.4 fl oz	61.6 fl oz	3	0.5	Contains bifenthrin insecticide. No more than 4 applications per year. Reapplications at least 10 days apart. No use in greenhouse.
	11 + M3	Dexter Max (azoxystrobin + mancozeb)	1.6 lb	12 lb	5	2	No more than 1 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	No more than 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	No more than 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.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	11 + 3	Veltyma (pyraclostrobin + mefentrifluconazole)	10 fl oz	30 fl oz	0	0.5	No more than 3 applications per year.
	11 + 7	Priaxor Everlon Republic (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	No more than 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	No more than 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. Reapplications at least 7 days apart. 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.
Timber rot, Sclerotinia stem rot, or white mold	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.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
<i>(Sclerotinia sclerotiorum)</i>	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 2SC	See individual label	See individual label	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	No more than 2 sequential applications allowed. No more than 6 applications per crop. Must alternate or tank-mix with a fungicide from a different FRAC group. Suppression.
	11 + 7	Priaxor Everlon Republic (pyraclostrobin + fluxapyroxad)	8 fl oz	24 fl oz	0	0.5	No more than 3 applications per season. No more than 2 sequential applications. See label about compatibility with other formulated products and adjuvants. Suppression.

¹ FRAC code (fungicide group): Numbers and letters (U) 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. Source: FRAC Code List; <https://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 season (or crop cycle) to a maximum rate per 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 7. Nonfumigant nematicides for tomatoes in Florida. Contact: Johan Desaegeer, UF/IFAS Gulf Coast Research and Education Center.

Product	Application Directions
Vydate L (a.i. oxamyl)	Apply ½–1 gal/A at planting, preferably via drip application. Make additional applications on a 10-to-14-day interval. No more than 3 gal/A per season. Reapplications at least 7 days apart unless a longer interval is stated. No 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 3.5–7 pt/A (56.0–80.0 fl oz/A) a minimum of 7 days before planting. Do not plant any unlisted crops into treated land for 365 days after application of the product. No more than 1 application per crop, and no more than 112 fl oz/A 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 crops.
Velum (a.i. fluopyram)	Apply max 6.84 fl oz/A using only chemigation into root-zone through low-pressure drip, trickle, microsprinkler, or equivalent equipment. Soil reapplications at least 7 days apart. No more than 13.7 fl oz/A of Velum (0.446 lb/A fluopyram) 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.
Salibro (a.i. fluazaindolizine)	Apply preplant incorporated, preplant drip or at-plant drip at 30.7–61.4 fl oz/A (1–2 lb a.i./A) as preplant incorporated, via preplant drip, or at-plant drip. Apply 15.4–30.7 fl oz/A (0.5–1 lb a.i./A) for in-season drip. No more than 61.4 fl oz/A per calendar year. No more than 4 applications per calendar year. Reentry interval is 12 hr. Reapplications at least 14 days apart. Preharvest interval is 1 day.
Biological nematicides	See chapter 19
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 8. Fumigant nematicides for tomatoes in Florida.

Nematicide	Broadcast Application ¹		In-the-Row Applications
	Gallons per Acre	fl oz/1000 ft/ chisel-spaced 12" apart	
Telone II ^{2,3}	27–35	79–102	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}	32.4–42	95–123	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}	39–50	114–146	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}	29–56	–	For drip fumigation, consult the product label for overall rate, drip concentration and flow-modifying application directions.
Pic Clor 60 ^{2,3}	19.5–31.5	57–90	Consult product label for overall rate and chisel flow-modifying application directions.
Pic Clor 60 EC ^{2,3}	19.5–31.5	–	For drip fumigation, consult product label for proportionately reduced overall rates, drip concentration, and drip flow-modifying directions and procedures.
Vapam HL	75	–	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	–	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	–	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 ft 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.

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The use of trade names in this publication is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and references to them in this publication do not signify our approval to the exclusion of other products of suitable composition.

Use pesticides safely. Read and follow directions on the manufacturer's label.

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