

Chapter 13. Pepper Production¹

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Botany and Planting

Bell pepper—*Capsicum annuum*, Solanaceae

Habanero and Bird's-eye pepper—*Capsicum chinense*

Cultivars

Sweet Bell

Antebellum. Green, sweet pepper with earlier setting patterns and more concentrated fruit set, deep-green color, and blocky shape. R to Xcv 1–10, TMV: 0; IR TSWV.

Aristotle. Green-to-red blocky bell with great yield potential. Extra-large, thick walled. Very vigorous plant that produces dark-green, anthocyaninless fruit. R to Xcv 1–3, PVY, Tobamo Po (R).

Autry. Uniformly blocky fruit that ripen red. Fruit set is concentrated, with high first-pick yields. R to Xcv 1–10, TMO and IR to TSWV.

Blitz. Early-maturing, extra-large, blocky, green-to-red bell with great yield potential at first harvest. Fruit are high quality with thick walls and a uniformly blocky shape. HR: TMV: 0 / Xcv: 0–5, 7–9 and IR: TEV.

Boca. Fruit is very dark green with thick firm walls. TSWV in addition to bacterial leaf spot resistance. R to Xcv 1–10.

Green Machine. Main-season hybrid bell pepper for the spring and fall season with robust plant that produces dark green, deep blocky, anthocyaninless fruits turning red at maturity. HR to TMV race 0 and IR to Xcv 1–10 and TSWV.

Nitro S10®. A mid-maturing hybrid suited for place pack. It is adapted to fall and spring in the Southeast. Fruit have good size uniformity, are smooth, firm, and glossy dark green, and mature to red color. R to TMV 0 and IR to Pc, TSWV, and Xcv 0–10.

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Placepack. Main-season, high-quality, dark-green pepper with high percentage of 4-lobes. Plants provide good cover. R to Xcv 1–10, PVY 0–1, Tm 0 and IR to TEV.

Provider. Dark-green fruit with plant structure and fruit set making it ideal for extended harvest. R to Xcv 1–10, PVY 0–1, Tm 0 and IR to TEV.

PS 09979325. Main-season hybrid that develops a mid-sized plant that produces green, maturing-to-red fruit targeted to the southeastern United States. The plants produce a high, concentrated set of firm, dark-green, smooth, blocky fruit 74 days after transplant. The hybrid is resistant to Tobamo Po and bacterial leaf spot races 0–10 (X10R).

PS 9928302. High resistance to bacterial spot races 1–5 (X5R) and combines a large, robust plant with large, dark-green to firm-red fruits. In trials, 8302 has been very adaptable with good size, shape, uniformity, and color. It is anthocyaninless. Xcv 1–5, Tm Po (HR).

Regulator. Widely adapted. Strong plant with good cover. Produces a high percentage of uniform, four-lobed fruit. R to Xcv 1–10, Tm 0 and IR to TSWV 0.

Seedway 48. Medium plant size with large to jumbo, uniform, and dark-green fruit. R to Xcv 1–10.

Shogun S10®. Extra-large, dark-green fruit with high yield potential. Adapted to late fall, winter, and spring in the Southeast. R to TMV 0 and IR to TSWV, Xcv 1–10.

SV3255PB. Main season variety with blocky green-to-red fruit. IR: Xcv 0–10.

Standout. Uniformly shaped, extra-large to jumbo-sized dark, glossy fruit.

Vanguard. Medium plant with good foliage. Fruit are dark green, blocky, 4-lobed, and extra large with thick firm walls. Early maturity with concentrated harvest. R to Xcv 1–5, PepMo and ToM.

Sweet Peppers

Boris. Sweet banana type with light-yellow to red fruit. R to TSWV.

Lemon Delite, Orange Delite, Ruby Delite. Series is a large-fruited snack pepper variety with very early maturity and hot set potential. R to TMV 0 and Xcv 0–3, 7, 8.

Natasha. Sweet banana with a vigorous plant. Light-yellow to red fruit. R to Xcv 1–3.

Sopron. Sweet banana type with light-yellow to red fruit. R to Xcv 1–3.

Cubanelle

Aruba. Early-maturing, erect plant, 3–4 lobed, elongated fruit, matures from a pale lime green to a bright red.

Bimini. Thick-walled, heavy fruit with good setting ability and excellent flavor. Performs well in both fall and spring seasons. T to Xcv 1–10.

Granada. Good canopy provides protection against sun scald, well-adapted to the Southeast. Heavy yields of sweet, thick-walled Cubanelle peppers. Peppers turn from light green to red at maturity. R to Xcv 0–3, 7, 8.

Key West. Long, lime-green fruit that matures to red. R to Xcv 1–3.

Hot Ancho Poblano

Hitman. Dark green and glossy open-field fruit with high percentage of two-lobed fruit. Medium-early maturity. R to Tm 0.

Massivo. Mostly two-lobed dark-green fruit. R to TMV.

Hot Cayenne

Arapaho. Cayenne type with early maturity on a medium-sized plant. Produces long (8–9 inch), medium-high pungent fruit with great flavor and aroma.

Iberia. Long hot type similar to Mesilla but longer and slightly hotter. R to TMV.

Mesilla. Long hot type produces very long (9–11 by 1.5 inch) fruit that can be used green or red. Pods grow pendant from a large plant, maturing at mid-season. R to Tobamo Po and PVY, and IR to TEV.

Hot Jalapeño

Baluarte. Large, thick-walled fruit, with low cracking. R to Xcv 1–3.

Compadre. Medium-to-late fruiting. Vigorous plant with good tolerance to high temperatures. Medium spicy (2,500–8, SHU). Continuous picking. Uniform, smooth, large fruit. No purpling. R to PVY, TM and Xcv 2, 5.

Everman. Shiny and uniform fruit with excellent weight and shelf life and no cracking. Open plant with good regrowth and continuous set during the cycle. R to Xcv 1–3.

Jedi (Jaguar). Vigorous plant with jumbo fruit. R to Xcv 1–3.

Lexus. Concentrated early-season fruit set. Glossy dark-green fruit. HR to Xcv 1–3.

Mixteco. Early-maturing, heavy and thick-walled fruit with deep-green color. Strong plant with good regrowth that brings high yield potential. R to Tm 0 and IR to Xcv 1–3.

Orizaba. Large, strong fruit with excellent leaf cover. Spicy with little cracking. R to Xcv 1–3.

PS 11435807. Vigorous medium plant with concentrated fruit set. Smooth dark-green fruit. R to PVY, TE. Intermediate resistance to root-knot nematode.

PS 11435810. Vigorous tall plant with pungent, dark-green, smooth fruit. R to root-knot nematode, *Phytophthora capsici*, PVY, TE.

Other Hot Peppers

Altiplano. Vigorous serrano pepper with uniform and glossy green fruit.

Balada. Finger hot Asian-type pepper, fruit maturing from green to red, fruit slightly curved, tapers to point, highly pungent.

Camino Real. Serrano type, medium maturity, large green-fruit size. R to PVY and IR to TEV.

Canario Real. A main-season, hot banana pepper with large, heavy fruit and vigorous plant habit.

Charger. Anaheim type with smooth, flat, thick-walled fruit that is mildly hot. IR to TSWV.

Devil Serrano. Early, large, dark-green glossy fruit. Semi-indeterminate bush. HR to TMV, PVY. IR to TEV.

Don Picoso. Dark-green serrano type with thick wall fruit.

Flaming Flare. Widely adapted Fresno pepper with 4-inch-long, thin-walled fruit with a sweet and mildly hot flavor. R to TMV.

Fresno 3429. Vigorous medium-to-tall plant. 75 days to maturity. Thick, firm wall, good shipper. Deep red at maturity.

Habanero. Habanero type (100,000–350,000 SHU), ready for harvest 90–100 days from transplant, extremely pungent, both fresh and processing markets. The wrinkled fruit taper to a point and measure approximately 2 by 1 inch. The thin flesh is light green to orange pink at full maturity.

Inferno. This Hungarian hot wax hybrid produces high yields of uniform fruit. The thick-walled pods mature from yellow to red and are pendant, large, smooth, tapered, and well-suited for fresh market and pickling.

Lone Ranger. Serrano pepper medium-heat variety with excellent plant cover, good heat setting (10,000–23,000 SHU), large size that averages between 4 and 4.5 inches, and thick walls for great shelf life. R to Xcv 0–3, 7, 8.

Megalodon. Large, habanero-type pepper with compact growth habit. Fruit green to orange to red.

Pathfinder. Serrano pepper with excellent plant and foliar cover, with an average fruit length of 4.5–5 inches. Dark-green fruit with thick walls are suitable for the export market. R to Xcv 0–3, 7, 8.

Rio de Oro. Very large Santa Fe type with wide shoulders. Matures from golden yellow to red.

Rio Tesoro. Hybrid yellow Caribe pepper. 3.5 inch by 2 inch fruit.

Super Habanero. Bright-red fruit with good shelf life. Medium-to-high plant vigor with good canopy coverage.

Table 1. Planting dates for pepper.

Planting Region	Dates	
	Traditional	Bird's Eye
North Florida	July–Aug; Feb–Mar	Aug; Feb–Mar
Central Florida	Aug–Sept; Jan–Mar	Aug–Sept; Jan–Mar
South Florida	Aug–Feb	Aug–Feb

Table 2. Planting information for pepper.

Planting Parameters	Measurements	
	Traditional	Bird's Eye
Distance between rows (in)	36–48 60–72	36–48
Number of rows/bed	1–2	1
Distance between rows/bed	15–18	10–24
Distance between plants (in)	9–15	0.5–0.75
Seed per acre in transplant (lb)	0.25–0.5	0.25–0.5
Days to maturity from transplant	65–75	–
Plant population (acre)	14,520–19,400	17,500

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 3. Herbicides approved for managing weeds in peppers. Labels change frequently. Be sure to read a current product label before applying any chemical. Contact: Nathan S. Boyd, UF/IFAS Gulf Coast Research and Education Center.

	Active Ingredient lb a.i./Acre	Trade Name Product/Acre	MOA Code	Weeds Controlled/Remarks
PREPLANT/ PREEMERGENCE	Bensulide 5.0–6.0	(Prefar) 4 E 5–6 qt	8	Broadleaves and grasses. Incorporate mechanically 1–2 inches deep or with irrigation 2–4 inches deep.
	Carfentrazone up to 0.031	(Aim) 2.0 EC up to 2 fl oz	14	Apply as a preplant burndown for emerged broadleaf weeds up to 4 inches tall or rosettes less than 3 inches across. Good coverage is essential. A nonionic surfactant, methylated seed oil, or crop oil concentrate is recommended. No pretransplant interval.
	Clomazone 0.25–1	(Command) 3ME 0.67 to 2.67 pt	15	Annual broadleaves and grasses. Do not use on banana peppers. Place the roots of transplanted peppers below the chemical barrier.
	Flumioxazin up to 0.128	(Chateau) EZ up to 4 oz	14	Annual broadleaves and grasses. Apply to row middles of raised plastic-mulched beds that are at least 4 inches higher than the treated row middles and with a 24-inch bed width. Do not apply after transplant. 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 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 bare-ground production 7 days before transplanting or to a formed bed but prior to laying plastic. Use shields or hooded sprayers if applying to row middles and prevent contact with plastic mulch. PHI 60 days.
	Glufosinate up to 0.79	(Rely) 280 43 oz		Burndown of emerged broadleaves, grasses, and nutsedge. May be applied as a pre-plant burndown and pre-plant to plastic mulch covered beds. See label for planting intervals. PHI 30 days.
	Glyphosate	(various formulations) consult labels	9	Emerged broadleaves, grasses, and nutsedge. Apply as a preplant burndown. Allow 3 days between application and planting. Consult label for individual product directions.
	Halosulfuron 0.024–0.05	(Sanda, Profine) 75 DF 0.5–1.0 oz	2	Broadleaves and yellow/purple nutsedge. Apply to row middles only. No more than 2 oz/A per 12-month period. PHI 30 days.
	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 the row middles only with a shielded or hooded sprayer. Product must not contact green foliage or fruit to avoid excessive injury. Drift of lactofen-treated soil particles onto plants can cause contact injury. Limit of 1 PRE and 1 POST application per growing season. PHI 30 days.
	Napropamide 1.0–2.0	(Devrinol) 2-XT 2–4 qt (Devrinol DF XT) 50 DF 4–8 lb	15	Annual broadleaves. Apply to bed tops after forming beds but before plastic application. Rainfall or overhead irrigate to 1 inch within 24 hr of application. For row-middle treatments, do not apply between bloom and harvest, and no more than 2 lb a.i./A per crop cycle.

	Active Ingredient lb a.i./Acre	Trade Name Product/Acre	MOA Code	Weeds Controlled/Remarks
	Oxyfluorfen 0.25–0.5	(Goal 2 XL) 2 EC 1–2 pt (GoalTender) 4 E 0.5–1.0 pt	14	Broadleaves. Apply as a preemergence broadcast or banded to preformed beds. 30-day pretransplant interval. Mulch may be applied any time during the 30-day interval.
	Paraquat 0.5–1.0	(Gramoxone) 2 SL 2.0–4.0 pt (Firestorm) 3 SL 1.3–2.7 pt	22	Emerged broadleaf and grass weeds. 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. Product is a contact, nonselective, foliar-applied herbicide with no residual control. May be tank-mixed with soil residual compounds.
	Pendimethalin 0.48–0.72	(Prowl H20) 3.8 1.0–1.5 pt	3	Annual broadleaves and grasses. May be applied to row middles or under the plastic. No more than 3.0 pt/A per year. PHI 70 days.
	Pyraflufen 0.001–0.003	(ET Herbicide) 0.208 EC 0.5–2.0 fl oz	14	Emerged broadleaves less than 4 inches tall or rosettes less than 3 inches diameter. Apply as a preplant burndown treatment. Nonionic surfactant or crop oil concentrate recommended.
	S-metolachlor 0.64–0.95	(Dual Magnum) 7.62 EC 0.67–1.0 pt	15	Annual broadleaves, grasses, and suppression of yellow/purple nutsedge. 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 the finished bed immediately before laying the plastic. No more than 1.68 pt/A of Dual Magnum per crop cycle. PHI 60 days.
	Sulfentrazone 0.09	Willowood Sulfentrazone 3 fl oz	14	Broadleaves, grasses, and nutsedge species. Apply under the plastic mulch or in row middles. Do not use on soils with less than 1% organic matter.
	Trifluralin 0.5–0.75	(Treflan, Trifluralin) 4 EC 1.0–1.5 pt (Treflan) 10 G 5.0–7.5 lb	3	Annual broadleaves and grasses. Incorporate 4 inches or less within 8 hr of application. Results in Florida are erratic on sandy soils with low organic matter. Note label precautions against planting noncrops within 5 months. Do not apply after transplanting. PHI 60 days.
POSTEMERGENCE/ POSTTRANSPLANT	Carfentrazone up to 0.031	(Aim) 2.0 EC up to 2 fl oz	14	Emerged broadleaves. Apply as hooded application to row middles only. May be tank-mixed with other herbicides. No more than 6.1 fl oz per cropping season. A nonionic surfactant, methylated seed oil, or crop oil concentrate is recommended. PHI 0 days.
	Clethodim 0.09–0.13 0.07–0.13	(Select Max) 1 EC 9–16 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 Dessiccant) 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 up to 1.24	(Rely) 280 64 oz		Burndown of emerged broadleaves, grasses, and nutsedge present between rows of established peppers. Apply with a hooded applicator. PHI 30 day.
	Halosulfuron 0.024–0.05	(Sanda, Profine) 75 DF 0.5–1.0 oz	2	Broadleaves and yellow/purple nutsedge. Apply to row middles only. No more than 2 oz/A per 12-month period. Nonionic surfactant recommended. PHI 30 days.
	Imazosulfuron 0.19–0.30	(League) 75 DF 4.0–6.4 oz	2	Broadleaves and yellow/purple nutsedge suppression. Pepper must be well established and 10 inches tall. Direct sprays to base of stem and avoid contact with leaves or fruit. No more than 6.4 oz/A per crop season. Observe crop rotation restrictions. Nonionic surfactant recommended. PHI 21 days.

	Active Ingredient lb a.i./Acre	Trade Name Product/Acre	MOA Code	Weeds Controlled/Remarks
	Paraquat 0.5	(Gramoxone) 2 SL 2 pt (Firestorm) 3 SL 1.3 pt	22	Emerged broadleaves and grasses. Direct spray over emerged weeds 1–6 inches tall in-the-row middles between mulched beds. Use low pressure and shields to control drift. No more than 3 times per season. Nonionic surfactant recommended. Consult label for new restrictions.
	Pelargonic acid	(Scythe) 4.2 EC 3%–10% v/v	27	Emerged broadleaves and grasses. 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 H20) 3.8 1.0–1.5 pt	3	Broadleaves and grasses. May be applied posttransplant to row middles if previously untreated. No more than 3.0 pt/A per year. PHI 70 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 0.95	(Dual Magnum) 7.62 EC 1.0 pt	15	Annual broadleaves, grasses, and yellow/purple nutsedge. Label is a Third-Party Registration (TPR, Inc.). Use without a signed authorization and waiver of liability is a misuse of the product. Direct spray solution to row middles only with minimal contact to plants and plastic. No more than 1.68 pt/A Dual Magnum per crop. PHI 60 days.
POSTHARVEST	Diquat 0.5	(Reglone Desiccant) 2.0 pt	22	No more than 35 gal/A. Thorough coverage is required. Nonionic surfactant recommended.

Table 4. Insecticides labeled for management of arthropod pests of peppers. **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)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
Aphids (including aphid-transmitted viruses, green peach aphid, potato aphid)	1A	*Lannate LV, *SP (methomyl)	LV: 1.5–3.0 pt SP: 0.5–1.0 lb	12 pt/A LV or 4 lb/A SP.	48	3	No more than 8 applications per crop.
	1A	*Vydate L (oxamyl)	Foliar: 2–4 pt Drip chemigation and soil injection systems: 2–4 pt/A of plant bed	24 pt/A	48	7	No more than 8 applications per season.
	1B	Acephate 90 WDG (acephate)	0.55–1.11 lb	2.22 lb/A	24	7	–
	1B	*Dibrom 8EC (naled)	1 pt	5 pt/A	48	1	No more than 5 applications. Do not apply when temperatures are > 90°F.
	1B	Dimethoate LV, EC, 2.67 (dimethoate)	LV & EC: 0.5–0.66 pt 2.67: 0.75–1.0 pt	1.65 lb a.i./A	48	0	Highly toxic to bees.
	1B	Malathion 5EC (malathion)	1.5–2.5 pt	No maximum.	12	3	No more than 2 applications per year.
	1B	Orthene 97 (acephate)	Bell peppers: 0.5–1.0 lb Non-bell peppers: 0.5 lb	2 lb a.i./A per crop cycle or 1 lb a.i./A for non-bell peppers	24	7	–
	3A	*Karate with Zeon (lambda-cyhalothrin)	1.28–1.92 fl oz	23.04 fl oz/A	24	5	Suppression only.
	3A	Pyganic EC 5.0 (pyrethrins)	4.5–15.6 fl oz	See label.	12	0	No more than 10 applications. Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. OMRI-listed. ²
	3A	*Warrior II (lambda-cyhalothrin)	1.28–1.92 fl oz	0.36 lb a.i./A	24	5	Suppression only.
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	19.0 fl oz/A of product	24	5	Toxic to bees.
	3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	19 fl oz	57 fl oz/A of product per year	12	7	Do not reapply this product or others containing either of the same active ingredients within 7 days.
	3A + 28	*Besiege (lambda-cyhalothrin + chlorantraniliprole)	6.0–9.0 fl oz	31.0 fl oz/A per year	24	5	Reapplications at least 5 days apart. Suppression only.
	4A	Actara (thiamethoxam)	2.0–3.0 oz	11 oz/A	12	0	Toxic to bees.
	4A	Admire Pro (imidacloprid)	7–14.0 fl oz	14.0 fl oz/A (0.5 lb a.i./A)	12	Soil: 21	Most effective if applied to soil at transplanting.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	4A	Admire Pro (imidacloprid)	0.44 fl oz/10,000 plants	0.44 fl oz/10,000 plants	12	Soil: 21	Planthouse: 1 Application to transplants: see label.
	4A	Assail 30SG (acetamiprid)	2.0–4.0 oz	16 oz/A	12	7	No more than 4 applications per season. Reapplications at least 7 days apart.
	4A	Assail 70WP (acetamiprid)	0.8–1.7 oz	6.8 oz/A	12	7	No more than 4 applications per season. Reapplications at least 7 days apart.
	4A	Belay 50 WDG (clothianidin)	1.6–2.1 oz	6.4 oz/A	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/A	12	Apply at planting	Do not release irrigation water from the treated area.
	4A	Platinum (thiamethoxam)	5–11 fl oz	11 fl oz/A	12	30	Soil application. See label for rotational restrictions.
	4A	Platinum 75 SG (thiamethoxam)	1.66–3.67 oz	3.8–6.2 oz/A	12	30	Soil application. See label for rotational restrictions.
	4A	Scorpion 35SL (dinotefuran)	Foliar: 2–7 fl oz Soil: 9–10.5 fl oz	10.5 fl oz/A as foliar sprays or 21 fl oz/A to soil	12	Foliar: 1 Soil: 21	Suppression only. Use only 1 application method (soil or foliar). Follow label restrictions to protect pollinators.
	4A	Venom (dinotefuran)	Foliar: 1–4 oz Soil: 5–7.5 oz	6 oz/A (foliar) or 12 oz/A (soil)	12	Foliar: 1 Soil: 21	Suppression only. Use only 1 application method (soil or foliar). No more than 3 applications per season.
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	13.0 fl oz/A	12	30	No more than 1 soil application per crop season. Several methods of soil application—see label.
	4A + 28	Voliam Flexi (thiamethoxam + chlorantraniliprole)	4–7 oz	14 oz/A	12	1	Not for greenhouses, transplants, or if seed was treated with thiamethoxam or other Group 4A insecticides. Do not use adjuvant on chili pepper or pimento. Highly toxic to bees.
	4C	Transform WG (sulfoxaflor)	0.75–1.0 oz	8.5 oz/A per year	12	1	No more than 0.070 lb a.i./A per season. No more than 2 applications per crop cycle.
	4D	Sivanto Prime (flupyradifurone)	7.0–12.0 fl oz	28.0 fl oz/A per year	4	1	Reapplications at least 7 days apart.
	9B	Fulfil (pymetrozine)	2.75 oz	5.5 oz/A per crop	12	0	No more than 2 applications.
	9B	PQZ (pyrifluquinazon)	2.4–3.2 fl oz	4.8 fl oz/A per crop cycle	12	1	No more than 2 applications per crop cycle.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	9D	Sefina Inscalis Insecticide (afidopyrophen)	3.0 fl oz	28 fl oz/A of product	12	0	No more than 2 sequential applications per year before using a different mode of action.
	23	Movento (spirotetramat)	4.0–5.0 fl oz	10 fl oz/A	24	1	Reapplications at least 7 days apart.
	28	Exirel (cyantraniliprole)	13.5–20.5 fl oz	0.4 lb a.i./A per crop.	12	1	Spray reapplications at least 5 days apart.
	28	Verimark (cyantraniliprole)	Soil at-planting or transplant trays: 6.75–13.5 fl oz Drip chemigation or soil injection: 6.75–10 fl oz	See Label	4	1	Suppression only.
	28 + 6	*Minecto Pro (cyantraniliprole + abamectin)	10 fl oz	20 fl oz/A	12	7	–
	29	Beleaf 50 SG (flonicamid)	2.8–4.28 oz	8.4 oz/A	12	0	Begin applications before pests reach damaging levels.
	U	Requiem 25EC (extract of <i>Chenopodium ambrosioides</i>)	2–4 qt		4	0	Begin before pests reach damaging levels.
Beetles (including beetle larvae, blister beetle, Colorado potato beetle, cucumber beetle, flea beetle)	1A	Carbaryl 4L (carbaryl)	0.5–2 qt	8 qt per crop per year	12	3	Bee Caution: DO NOT apply to weeds or crops in bloom.
	1A	Sevin XLR; 4F (carbaryl)	XLR, 4F: 0.5–2.0 qt	8 qt/A per crop	12	3	No more than 7 applications. Do not apply to crops or weeds in bloom.
	1B	*Dibrom 8EC (naled)	1 pt	5 pt/A	48	1	No more than 1 pt/A in Florida. Do not apply when temperatures are over 90°F.
	3A	*Ambush 25W (permethrin)	6.4–12.8 oz	1.6 lb a.i./A	12	3	Bell peppers only.
	3A	*Asana XL (esfenvalerate)	5.8–9.6 fl oz	0.35 lb a.i./A.	12	7	Repeat applications at 7-to-10-day intervals to achieve control.
	3A	*Brigade 2EC (bifenthrin)	2.1–6.4 fl oz	0.2 lb a.i./A.	12	7	Reapplications at least 7 days apart.
	3A	*Hero (bifenthrin + zeta-cypermethrin)	4.0–10.3 oz	27.39 oz/A of product	12	7	Refer to label's maximum usage table when applying Hero and another product containing either of the same active ingredients.
	3A	*Karate with Zeon (lambda-cyhalothrin)	1.28–1.92 fl oz	23.04 fl oz/A	24	5	–
	3A	*Pounce 25 WP (permethrin)	6.4–12.8 oz	0.8 lb a.i./A	12	3	Labeled for bell peppers. Reapplications at least 5 days apart.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	3A	Pyganic EC 5.0 (pyrethrins)	4.5–15.6 fl oz	See label.	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. No more than 10 applications. OMRI-listed. ²
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	19.0 fl oz/A	24	5	Reapplications at least 5 days apart. Toxic to bees.
	3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	19 fl oz	57 fl oz/A	12	7	Do not reapply this product or others containing either of the same active ingredients within 7 days.
	3A + 28	*Besiege (lambda-cyhalothrin + chlorantraniliprole)	6.0–9.0 fl oz	31.0 fl oz/A per year	24	5	Reapplications at least 5 days apart.
	4A	Actara (thiamethoxam)	2.0–3.0 oz	11 oz/A	12	0	Toxic to bees.
	4A	Admire Pro (imidacloprid)	7–14.0 fl oz	14.0 fl oz/A	12	Soil: 21	Most effective if applied to soil at transplanting.
	4A	Assail 70WP (acetamiprid)	0.6–1.1 oz		12	7	No more than 4 applications per season or reapplication within 7 days.
	4A	Belay 50 WDG (clothianidin)	1.6–2.1 oz	6.4 oz/A	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/A	12	Apply at planting.	Do not release irrigation water from the treated area.
	4A	Platinum 75 SG (thiamethoxam)	1.66–3.67 oz	11 fl oz/A	12	30	Soil application. See label for rotational restrictions.
	4A	Provado 1.6F (imidacloprid)	3.8–6.2 oz	19.2 fl oz/A per crop	12	0	Do not apply to crop treated with imidacloprid or thiamethoxam. Reapplications at least 5 days apart.
	4A	Scorpion 35SL (dinotefuran)	Foliar: 2–7 fl oz Soil: 9–10.5 fl oz	10.5 fl oz/A (foliar sprays) or 21 fl oz/A (soil)	12	Foliar: 1 Soil: 21	Application restrictions exist because of risk to bees and other insect pollinators. Follow directions for use to protect pollinators. Use only 1 application method.
	4A	Venom (dinotefuran)	Foliar: 1–4 oz Soil: 5–7.5 oz	6 oz/A (foliar) or 12 oz/A (soil)	12	Foliar: 1 Soil: 21	Use only 1 application method (soil or foliar). No more than 3 applications per season.
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	13.0 fl oz/A of product	12	30	No more than 1 soil application per crop season. Several methods of soil application—see label.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	4A + 28	Voliam Flexi (thiamethoxam + chlorantraniliprole)	4–7 oz	14 oz/A of product	12	1	Not for greenhouses, transplants, or if seed was treated with thiamethoxam or other Group 4A insecticides. Do not use adjuvant on chili pepper or pimiento. Highly toxic to bees.
	4D	Sivanto 200 SL (flupyradifurone)	10.5–14.0 fl oz	28.0 fl oz/A per year	4	1	Reapplications at least 7 days apart.
	5	Radiant SC (spinetoram)	5–10 fl oz	34 fl oz/A per year	4	1	Reapplications at least 4 days apart. No more than 6 applications per year.
	6	Abba Ultra (abamectin)	4.0–8.0 fl oz	24 fl oz foliarly applied per year.	12	7	No more than 2 sequential applications of product or same active ingredient. Reapplications at least 7 days apart.
	28	Coragen (chlorantraniliprole)	Foliar: 3.5–7.5 fl oz	15.4 fl oz/A per crop	4	1	Can apply by drip chemigation, at planting to soil and foliar. No more than 4 applications per crop.
	28	Exirel (cyantraniliprole)	7.0–13.5 fl oz	0.4 lb a.i./A per crop.	12	1	Spray reapplication at least 5 days apart.
	28	Verimark (cyantraniliprole)	Soil at-planting or transplant trays: 6.75–13.5 fl oz Drip chemigation or soil injection: 6.75–10 fl oz	0.4 lb a.i./A per crop	4	1	–
	28 + 6	*Minecto Pro (cyantraniliprole + abamectin)	5.5–10 fl oz	20 fl oz/A per calendar year	12	7	–
	U	Azatin XL (azadirachtin)	5–16 fl oz	–	4	0	Antifeedant, repellent, IGR (insect growth regulator).
	U	Surround (kaolin)	12.50–50 lb	–	4	0	12.5 lb/25 gal preferred up to fruit set. Apply only up to 1/4 of desired fruit size unless washing capabilities are sufficient.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
Caterpillars (including cabbage looper, corn earworm, garden webworm loopers, hornworms, salt marsh caterpillars, tobacco budworm, tomato fruitworm, tomato pinworm, beet armyworm, fall armyworm, southern armyworm)	1A	Carbaryl 4L (carbaryl)	1–2 qt	8 qt per crop per year	12	3	Do not apply to target crop or weeds in bloom. No more than 7 applications per year.
	1A	*Lannate LV, *SP (methomyl)	LV: 0.75–3.0 pt SP: 0.25–1.0 lb	12 pt/A LV or 4 lb/A SP	48	3	No more than 8 applications per crop.
	1A	Sevin XLR; 4F (carbaryl)	XLR, 4F: 1–2 qt	8 qt/A	12	3	No more than 7 applications. Do not apply to crops or weeds in bloom.
	1B	Acephate 90 WDG (acephate)	0.55–1.11 lb	2.22 lb/A per crop cycle	24	7	Bell-type peppers only.
	1B	Lorsban 75WG (chlorpyrifos) [24(c) label] SLN FL-040005	1.33 lb	10.64 lb/A	24	7	Do not apply within 10 days of transplanting or to plants under severe heat or drought stress. No more than 8 applications.
	1B	Orthene 97 (acephate)	Bell peppers: 0.50–1.00 lb	2 lb a.i./A	24	7	–
	3A	*Ambush 25W (permethrin)	6.4–12.8 oz	1.6 lb a.i./A	12	3	Bell peppers only.
	3A	*Asana XL (esfenvalerate)	5.8–9.6 fl oz	0.35 lb a.i./A	12	7	–
	3A	*Baythroid XL (beta-cyfluthrin)	1.6–2.8 fl oz	16.8 fl oz/A	12	7	Beet armyworm 1st and 2nd instars only. No more than 2.8 fl oz/A within 7 days.
	3A	*Brigade 2EC (bifenthrin)	2.1–6.4 fl oz	0.2 lb a.i./A	12	7	Reapplications at least 7 days apart.
	3A	*Danitol 2.4 EC (fenpropathrin)	10.67 fl oz	42.67 oz/A	24	3	Do not mix with copper. No more than 4 applications.
	3A	*Hero (bifenthrin + zeta-cypermethrin)	4.0–10.3 oz	27.39 oz/A	12	7	Refer to label's maximum usage table when applying Hero and another product containing either of the same active ingredients.
	3A	*Karate with Zeon (lambda-cyhalothrin)	0.96–1.92 fl oz	23.04 fl oz/A or 0.36 lb a.i./A	24	5	–
	3A	*Pounce 25 W (permethrin)	6.4–12.8 oz	0.8 lb a.i./A	12	3	Labeled for bell peppers. Reapplications at least 5 days apart.
	3A	Pyganic EC 5.0 (pyrethrins)	4.5–15.6 fl oz	See label.	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. No more than 10 applications. OMRI-listed. ²
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	0.36 lb a.i./A	24	5	–
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	19.0 fl oz/A of product	24	5	Toxic to bees.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	3A + 28	*Besiege (lambda-cyhalothrin + chlorantraniliprole)	Cabbage looper, cutworms and hornworms: 5.0–8.0 fl oz All others: 6.0–9.0 fl oz	31.0 fl oz/A per year	24	5	Reapplications at least 5 days apart.
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	13.0 fl oz/ A	12	30	Make only 1 soil application per crop season. Several methods of soil application—see label.
	4A + 28	Voliam Flexi (thiamethoxam + chlorantraniliprole)	4–7 oz	14 oz/A or 0.172 lb a.i./A of thiamethoxam or 0.2 lb a.i./A of chlorantraniliprole products	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.
	5	Radiant SC (spinetoram)	5–10 fl oz	34 fl oz/A per year	4	1	Reapplications at least 4 days apart. No more than 6 applications per year.
	6	Abba Ultra (abamectin)	8.0 fl oz	24 fl oz per year	12	7	Tomato pinworm. No more than 2 sequential applications of product or same active ingredient. Reapplications at least 7 days apart.
	6	*Proclaim (emamectin benzoate)	2.4–4.8 oz	28.8 oz/A	12	7	–
	15	*Dimilin 25W, *2L (diflubenzuron)	4–8 oz	24 oz/A	12	7	No more than 5 applications per season. IGR effects not seen for 5–7 days.
	15	Rimon 0.83EC (novaluron)	9–12 fl oz	36 fl oz/A	12	1	Do not use with an adjuvant.
	18	Confirm 2F (tebufenozide)	6–16 fl oz	1.0 lb a.i./A	4	7	–
	18	Intrepid 2F (methoxyfenozide)	4–16 fl oz	64 fl oz/A	4	1	–
	22A	Avaunt eVo (indoxacarb)	2.5–6.0 fl oz	24 fl oz	12	3	No more than 4 applications per season.
	28	Coragen (chlorantraniliprole)	3.5–7.5 fl oz	15.4 fl oz/A per crop	4	1	Can be applied as drip, soil, or foliar application . See label.
	28	Exirel (cyantraniliprole)	7–17 fl oz	0.4 lb a.i./A per crop	12	1	Spray reapplications at least 5 days apart.
	28	Verimark (cyantraniliprole)	Soil at-planting or transplant tray treatment: 5–13.5 fl oz Drip, soil injection or chemigation: 5–10 fl oz	0.4 lb a.i./A per crop	4	1	–

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	28 + 6	*Minecto Pro (cyantraniliprole + abamectin)	Tomato pinworms: 10 fl oz Loopers: 7.5–10 fl oz All others: 5.5–10 fl oz	20 fl oz/A per calendar year	12	7	–
	U	Azatin XL (azadirachtin)	5–21 fl oz		4	0	Antifeedant, repellent, IGR.
Fire ants	7A	Extinguish (S-methoprene)	1.0–1.5 lb	–	4	0	–
	7C	Esteem Ant Bait (pyriproxyfen)	1.5–2.0 lb	–	12	1	Apply when ants are actively foraging.
Grasshoppers	1B	Acephate 90 WDG (acephate)	0.28–1.11 lb	2.22 lb/A or 2.0 lb a.i./A per crop cycle	24	7	Bell-type peppers only.
	1B	Orthene 97 (acephate)	Bell peppers: 0.25–0.5 lb	2 lb a.i./A	24	7	Bell-type peppers only.
	3A	*Hero (bifenthrin + zeta-cypermethrin)	4.0–10.3 oz	27.39 oz/A of product	12	7	Refer to label's maximum usage table when applying Hero and another product containing either of the same active ingredients.
	3A	*Karate with Zeon (lambda-cyhalothrin)	1.28–1.92 fl oz	23.04 fl oz/A	24	5	–
	3A	Pyganic EC 5.0 (pyrethrins)	4.5–15.6 fl oz	See label.	12	0	Pyrethrins degrade rapidly in sunlight. Thorough coverage is important. No more than 10 applications. OMRI-listed. ²
	3A	*Warrior II (lambda-cyhalothrin)	1.28–1.92 fl oz	0.36 lb a.i./A	24	5	–
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	19.0 fl oz/A of product	24	5	–
	3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	19 fl oz	57 fl oz/A of product	12	7	Do not reapply this product
	3A + 28	*Besiege (lambda-cyhalothrin + chlorantraniliprole)	6.0–9.0 fl oz	31.0 fl oz/A per year	24	5	Reapplications at least 5 days apart.
	4A	Scorpion 35SL (dinotefuran)	Foliar: 2–7 fl oz Soil: 9–10.5 fl oz	10.5 fl oz/A (foliar sprays) or 21 fl oz/A (soil)	12	Foliar: 1 Soil: 21	Risk to bees and other insect pollinators.
	4A	Venom (dinotefuran)	Foliar: 1–4 oz Soil: 5.0–7.5 oz	6 oz/A (foliar) or 12 oz/A (soil)	12	Foliar: 1 Soil: 21	Use only 1 application method (soil or foliar). No more than 3 applications per season. Toxic to bees.
	U	Surround (kaolin)	12.50–50 lb	–	4	0	12.5 lb is the preferred rate up to fruit set.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
Lace bugs	1A	Carbaryl 4L (carbaryl)	1–2 qt	8 qt per crop per year	12	3	Do not apply to crops in bloom. No more than 7 applications per year.
	1A	Sevin XLR; 4F (carbaryl)	XLR, 4F: 1.0–2.0 qt	8 qt/A per crop	12	3	No more than 7 times. Do not apply to crops or weeds in bloom.
Leafhoppers	1A	Carbaryl 4L (carbaryl)	0.5–1 qt	8 qt/A per year	12	3	Do not apply to crops or weeds in bloom. Toxic to bees.
	1A	Sevin XLR; 4F (carbaryl)	XLR, 4F: 0.5–1.0 qt	8 qt/A per crop	12	3	No more than 7 applications. Do not apply to crops or weeds in bloom.
	3A	*Baythroid XL (beta-cyfluthrin)	1.6–2.8 fl oz	16.8 fl oz/A or 0.132 lb a.i./A	12	7	–
	3A	*Hero (bifenthrin + zeta-cypermethrin)	4.0–10.3 oz	27.39 oz/A	12	7	Follow label
	3A	*Karate with Zeon (lambda-cyhalothrin)	1.28–1.92 fl oz	23.04 fl oz/A or 0.36 lb a.i./A	24	5	–
	3A	*Warrior II (lambda-cyhalothrin)	1.28–1.92 fl oz	0.36 lb a.i./A	24	5	–
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	19.0 fl oz/A	24	5	–
	3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	19 fl oz	57 fl oz/A of product or 0.036 lb/A of avermectin or 0.078 lb/A per cropping year	12	7	Do not reapply this product or others containing either of the same active ingredients within 7 days.
	4A	Admire Pro (imidacloprid)	7–14.0 fl oz	14.0 fl oz/A	12	Soil: 21	Most effective if applied to soil at transplanting.
	4A	Belay 50 WDG (clothianidin)	Foliar: 1.6–2.1 oz	6.4 oz/A	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/A	12	Apply at planting	Do not release irrigation water from the treated area.
	4A	Platinum (thiamethoxam)	5–11 fl oz	11 fl oz/A of Platinum or 0.172 lb a.i./A	12	30	Soil application. See label for rotational restrictions.
	4A	Provado 1.6F (imidacloprid)	3.8–6.2 oz	19.2 fl oz/A per crop	12	0	Do not apply to crop treated with imidacloprid or thiamethoxam. Reapplications at least 5 days apart.
	4A	Scorpion 35SL (dinotefuran)	Foliar: 2–7 fl oz Soil: 9–10.5 fl oz	10.5 fl oz/A (foliar sprays) or 21 fl oz/A (soil)	12	Foliar: 1 Soil: 21	Risk to bees and other insect pollinators. Use 1 application method.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	13.0 fl oz/A	12	30	Make only 1 soil application per crop season.
	4A + 28	Voliam Flexi (thiamethoxam + chlorantraniliprole)	4–7 oz	14 oz/A per growing season	12	1	Reapplications at least 5 days apart. Highly toxic to bees.
	4D	Sivanto 200 SL (flupyradifurone)	7.0–10.5 fl oz	28.0 fl oz/A per year	4	1	Reapplications at least 7 days apart.
	16	Courier SC (buprofezin)	9.0–13.6 fl oz	27.2 fl oz/A per crop cycle	12	1	No more than 2 applications per season. Reapplication at least 5 apart.
	U	Surround (kaolin)	12.50–50 lb	–	4	0	12.5 is the preferred rate up to fruit set.
Liriomyza leafminers (includes leafminer larvae)	1A	*Vydate L (oxamyl)	Foliar: 2–4 pt/A	24 pt/A	48	7	May also be applied by drip chemigation or soil injection systems. See label for rate.
	1B	*Dibrom 8EC (naled)	1 pt	6 pt/A	48	1	No more than 1 pt/A in Florida. Do not apply when temperatures are over 90°F.
	1B	Dimethoate LV, EC, 2.67 (dimethoate)	LV & EC: 0.5–0.66 pt 2.67: 0.75–1.0 pt	1.65 lb a.i./A per year	48	0	Highly toxic to bees.
	3A	*Ambush 25W (permethrin)	6.4–12.8 oz	1.6 lb a.i./A	12	3	Bell peppers only.
	3A	*Baythroid XL (beta-cyfluthrin)	2.8 fl oz	16.8 fl oz/A or 0.132 lb a.i./A	12	7	Suppression only.
	3A	*Brigade 2EC (bifenthrin)	2.1–6.4 fl oz	0.2 lb a.i./A	12	7	Reapplications at least 7 days apart.
	3A	*Hero (bifenthrin + zeta-cypermethrin)	4.0–10.3 oz	27.39 oz/A of product or 0.266 lb a.i./A	12	7	Refer to label's maximum usage table when applying Hero and another product containing either of the same active ingredients.
	3A	*Karate with Zeon (lambda-cyhalothrin)	1.28–1.92 fl oz	23.04 fl oz/A or 0.36 lb a.i./A	24	5	Suppression only.
	3A	*Pounce 25 W (permethrin)	6.4–12.8 oz	0.8 lb a.i./A	12	3	Labeled for bell peppers. Reapplications at least 5 days apart.
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.5 fl oz	19.0 fl oz/A	24	5	Suppression only. For control: tank-mix with 2–2.5 oz/A of Actara.
	3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	19 fl oz	57 fl oz/A per 12-month cropping year.	12	7	Do not reapply this product or others containing either of the same active ingredients within 7 days.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	4A	Belay 50 WDG (clothianidin)	Foliar: 1.6–2.1 oz	6.4 oz/A	12	7	Suppression only. 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/A	12	Apply at planting	Suppression only. Do not release irrigation water from the treated area.
	4A	Scorpion 35SL (dinotefuran)	Foliar: 2–7 fl oz Soil: 9–13 fl oz	10.5 fl oz/A (foliar sprays) or 21 fl oz/A (soil)	12	Foliar: 1 Soil: 21	Risk to bees and other insect pollinators.
	4A + 28	Voliam Flexi (thiamethoxam + chlorantraniliprole)	4–7 oz	14 oz/A of product or 0.172 lb a.i./A of thiamethoxam or 0.2 lb a.i./A of chlorantraniliprole products	12	1	Suppression only. Do not use in greenhouses or on transplants. Highly toxic to bees.
	5	Radiant SC (spinetoram)	6–10 fl oz	34 fl oz/A or 0.266 lb a.i./A per year	4	1	Reapplications at least 4 days apart. No more than 6 applications per year.
	6	Abba Ultra (abamectin)	4.0–8.0 fl oz	24 fl oz/A or 0.056 lb a.i. foliarly applied per year	12	7	No more than 2 sequential applications of product or same active ingredients. Reapplications at least 7 days apart.
	6	*Agri-Mek SC (abamectin)	1.7–3.5 fl oz	10.25 fl oz/A (0.056 lb a.i./A)	12	7	No more than 2 sequential applications per year. Must be used with a nonionic activator-type wetting, spreading, or penetrating adjuvant.
	15	Rimon 0.83EC (novaluron)	12 fl oz	36 fl oz/A	12	1	Do not use with an adjuvant.
	17	Trigard (cyromazine)	2.66 oz (1 packet)	15.96 oz/A	12	0	No more than 6 applications per crop.
	28	Coragen (chlorantraniliprole)	5.0–7.5 fl oz	15.4 fl oz/A or 0.2 lb a.i./A per crop	4	1	Can be applied by drip chemigation or as a soil application at planting as well as a foliar spray. See label. No more than 4 applications per crop.
	28	Exirel (cyantraniliprole)	13–20.5 fl oz	0.4 lb a.i./A per crop	12	1	Spray reapplications at least 5 days apart.
	28	Verimark (cyantraniliprole)	Soil at-planting or transplant tray treatment: 6.75–13.5 fl oz Drip, soil injection or chemigation: 6.75–10 fl oz	0.4 lb a.i./A per crop	4	1	–
	28 + 6	*Minecto Pro (cyantraniliprole + abamectin)	5.5–10 fl oz	20 fl oz/A per calendar year	12	7	–

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	U	Requiem 25EC (extract of <i>Chenopodium ambrosioides</i>)	3–4 qt	–	4	0	Begin before pests reach damaging levels.
Mealybugs	1B	*Dibrom 8EC (naled)	1 pt	6 pt/A	48	1	No more than 1 pt/A in Florida. Do not apply when temperatures are over 90°F.
Mites (including broad mites, carmine spider mite, tomato russet mite, two spotted spider mite)	3A	*Brigade 2EC (bifenthrin)	5.12–6.4 fl oz	0.2 lb a.i./A	12	7	Reapplications at least 7 days apart.
	3A	*Danitol 2.4 EC (fenpropathrin)	10.67 fl oz	4 applications (0.8 lb a.i./A)	24	3	Do not apply with copper.
	3A	*Hero (bifenthrin + zeta-cypermethrin)	10.3 oz	27.39 oz/A or 0.266 lb a.i./A	12	7	Refer to label's maximum usage table when applying Hero and another product containing either of the same active ingredients.
	3A	*Karate with Zeon (lambda-cyhalothrin)	1.28–1.92 fl oz	23.04 fl oz/A or 0.36 lb a.i./A	24	5	Suppression only (spider mite species).
	3A	*Warrior II (lambda-cyhalothrin)	1.28–1.92 fl oz	0.36 lb a.i./A	24	5	Suppression only (spider mite species).
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.5 fl oz	19.0 fl oz/A	24	5	Suppression only. For control: tank-mix with 2–2.5 oz/A of Actara.
	3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	19 fl oz	57 fl oz/A of product or 0.036 lb/A of avermectin or 0.078 lb/A of z-cypermethrin per 12-month cropping year	12	7	Do not reapply this product or others containing either of the same active ingredients within 7 days.
	6	Abba Ultra (abamectin)	4.0–8.0 fl oz	24 fl oz product or 0.056 lb a.i. foliarly applied per year	12	7	No more than 2 sequential applications of product.
	6	*Agri-Mek SC (abamectin)	1.7–3.5 fl oz	10.25 fl oz/A (0.056 lb a.i./A)	12	7	No more than 2 sequential applications per year. Must be used with a nonionic activator-type wetting, spreading, or penetrating adjuvant.
	10B	Zeal WDG Miticide (etoxazole)	2.0–3.0 oz	3.0 fl oz/A	12	7	Do not use with an adjuvant or surfactant. No more than 1 application.
	20B	Kanemite 15 SC (acequinocyl)	31.0 fl oz	62 fl oz/A	12	1	Reapplications at least 21 days apart. No more than 2 applications per year. Do not use an adjuvant.
	20D	Acramite-50WS (bifenazate)	0.75–1.0 lb	1.0 lb	12	3	No more than 1 application
	21A	Magister (fenazaquin)	24–36 fl oz	36 fl oz	12	3	No more than 1 application per year.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	21A	Portal (fenpyroximate)	2.0 pt	No more than 4.0 pt/A per crop cycle	12	1	No more than 2 applications per season. Reapplications at least 14 days apart.
	23	Oberon 2SC (spiromesifen)	7.0–8.5 fl oz	25.5 fl oz/A	12	1	No more than 3 applications.
	28 + 6	*Minecto Pro (cyantraniliprole + abamectin)	5.5–10 fl oz	20 fl oz/A per calendar year	12	7	–
	U	MET52 EC (<i>Metarhizium anisopliae</i> strain F52)	Drench: 40–80 fl oz/100 gal Foliar: 0.5 pt–2 qt/A	–	4	0	–
Plant bugs (includes tarnished plant bug)	1A	Sevin XLR; 4F (carbaryl)	XLR, 4F: 1–2 qt	10 lb or 8 qt /A per crop	12	3	No more than 7 applications. Do not apply to crops or weeds in bloom.
	3A	*Karate with Zeon (lambda-cyhalothrin)	1.28–1.92 fl oz	23.04 fl oz/A or 0.36 lb a.i./A	24	5	–
	3A	*Warrior II (lambda-cyhalothrin)	1.28–1.92 fl oz	0.36 lb a.i./A	24	5	–
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	19.0 fl oz/A	24	5	–
	3A + 28	*Besiege (lambda-cyhalothrin + chlorantraniliprole)	6.0–9.0 fl oz	31.0 fl oz/A per year	24	5	Reapplications at least 5 days apart.
	4A	Belay 50 WDG (clothianidin)	Foliar: 1.6–2.1 oz	6.4 oz/A	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/A	12	Apply at planting	Do not release irrigation water from the treated area.
	4C	Transform WG (sulfoxaflor)	1.15–2.25 oz	8.5 oz/A per year	12	1	No more than 0.070 lb a.i./A per season. No more than 2 applications per crop cycle.
	29	Beleaf 50 SG (flonicamid)	2.0–4.28 oz	8.4 oz/A	12	0	Begin applications before pests reach damaging levels.
	U	M-Pede 49% EC (soap, insecticidal)	1%–2% v/v	–	12	0	OMRI-listed. ²
	U	Suffoil-X (petroleum oil)	1–2 gal/100 gal of water	–	4	0	OMRI-listed. ²

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
Planthoppers	4A	Scorpion 35SL (dinotefuran)	Foliar: 2–7 fl oz Soil: 9–10.5 fl oz	10.5 fl oz/A (foliar sprays) or 21 fl oz/A (soil)	12	Foliar: 1 Soil: 21	Risk to bees and other insect pollinators. Follow application restrictions found in the directions for use to protect pollinators. Use only 1 application method.
	16	Courier SC (buprofezin)	9.0–13.6 fl oz	27.2 fl oz/A per crop cycle	12	1	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 200 SL (flupyradifurone)	10.5–14.0 fl oz	28.0 fl oz/A per year	4	1	Reapplications at least 7 days apart.
	6	Abba Ultra (abamectin)	4.0–8.0 fl oz	24 fl oz product or 0.056 lb a.i. foliarly applied per year	12	7	No more than 2 sequential applications of product or same active ingredient. Reapplications at least 7 days apart.
	23	Movento (spirotetramat)	4.0–5.0 fl oz	10 fl oz/A	24	1	Reapplications at least 7 days apart.
Stinkbugs (including brown stinkbug, green stinkbug, southern green stinkbug)	1A	Carbaryl 4L (carbaryl)	1–2 qt	8 qt per crop per year	12	3	Suppression only.
	1A	Sevin XLR; 4F (carbaryl)	XLR, 4F: 0.5–2.0 qt	10 lb or 8 qt/A per crop	12	3	Suppression. No more than 7 applications. Do not apply to crops or weeds in bloom.
	3A	*Baythroid XL (beta-cyfluthrin)	1.6–2.8 fl oz	16.8 fl oz/A or 0.132 lb a.i./A	12	7	–
	3A	*Danitol 2.4 EC (fenpropathrin)	10.67 fl oz	(0.8 lb a.i./A)	24	3	–
	3A	*Hero (bifenthrin + zeta-cypermethrin)	4.0–10.3 oz	27.39 oz/A or 0.266 lb a.i./A	12	7	Refer to label's maximum usage table when applying Hero and another product containing either of the same active ingredients.
	3A	*Karate with Zeon (lambda-cyhalothrin)	1.28–1.92 fl oz	23.04 fl oz/A or 0.36 lb a.i./A	24	5	–
	3A	*Warrior II (lambda-cyhalothrin)	1.28–1.92 fl oz	0.36 lb a.i./A	24	5	–
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	19.0 fl oz/A	24	5	–
	3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	19 fl oz	57 fl oz/A of product or 0.036 lb/A of avermectin per cropping year	12	7	Do not reapply this product or others containing either of the same active ingredients within 7 days.
	4A	Actara (thiamethoxam)	3.0–5.5 oz	Maximum of 11 oz/A or 0.172 lb a.i./A s per growing season	12	0	Toxic to bees.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	4A	Scorpion 35SL (dinotefuran)	Foliar: 2–7 fl oz Soil: 9–10.5 fl oz	10.5 fl oz/A as foliar sprays or 21 fl oz/A to soil	12	Foliar: 1 Soil: 21	Risk to bees and other insect pollinators. Use only 1 application method.
	4A	Venom (dinotefuran)	Foliar (only): 1–4 oz	6 oz/A (foliar) or 12 oz/A (soil)	12	Foliar: 1 Soil: 21	Use only 1 application method. No more than 3 applications per season.
	4A	Belay 50 WDG (clothianidin)	Foliar: 1.6–2.4 oz	6.4 oz/A	12	7	Do not use an adjuvant. Toxic to bees. Do not release irrigation water from the treated area.
	4A + 28	Voliam Flexi (thiamethoxam + chlorantraniliprole)	4–7 oz	14 oz/A	12	1	Highly toxic to bees.
	15	Rimon 0.83EC (novaluron)	12 fl oz	36 fl oz/A	12	1	Do not use with an adjuvant.
	U	Aza-Direct (azadirachtin)	1–2 pt, up to 3.5 pt if needed	–	4	0	Antifeedant, repellent, IGR. OMRI-listed. ²
Thrips Check label for species controlled (includes eastern flower thrips, foliar feeding thrips, chilli thrips, melon thrips, western flower thrips)	1A	Carbaryl 4L (carbaryl)	1–2 qt	8 qt per crop per year	12	3	Suppression.
	1A	Sevin XLR; 4F (carbaryl)	XLR, 4F: 1.0–2.0 qt	10 lb or 8 qt/A per crop	12	3	Suppression. No more than 7 applications. Do not apply to crops or weeds in bloom.
	1A	*Vydate L (oxamyl)	Foliar: 2–4 pt	24 pt/A	48	7	Does not control western flower thrips.
	1B	Lorsban 75WG (chlorpyrifos) [24(c) label] SLN FL-040005	1.33 lb	10.64 lb/A per crop	24	7	No more than 8 applications.
	3A	*Baythroid XL (beta-cyfluthrin)	2.1–2.8 fl oz	16.8 fl oz /A	12	7	Not effective on <i>Thrips palmi</i> .
	3A	*Brigade 2EC (bifenthrin)	2.1–6.4 fl oz	0.2 lb a.i./A	12	7	Reapplications at least 7 days apart.
	3A	*Hero (bifenthrin + zeta-cypermethrin)	10.3 oz	27.39 oz/A of product or 0.266 lb a.i./A	12	7	Refer to label's maximum usage table when applying Hero and another product containing either of the same active ingredients.
	3A	*Warrior II (lambda-cyhalothrin)	1.28–1.92 fl oz	0.36 lb a.i./A	24	5	Will not control Western Flower Thrips.
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.5 fl oz	19.0 fl oz/A	24	5	Will not control Western Flower Thrips.
	3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	19 fl oz	57 fl oz/A of product or 0.036 lb/A of avermectin or 0.078 lb/A of z-cypermethrin per 12-month cropping year	12	7	Do not reapply this product or others containing either of the same active ingredients within 7 days.
	4A	Admire Pro (imidacloprid)	7–14.0 fl oz	14.0 fl oz/A (0.5 lb a.i./A)	12	Soil: 21	Most effective if applied to soil at transplanting.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	4A	Assail 30SG (acetamiprid)	4.0 oz	16 oz/A of Assail 30SG per growing season	12	7	No more than 4 applications per season. Reapplications at least 7 days apart.
	4A	Assail 70WP (acetamiprid)	1.7 oz	6.8 oz/A	12	7	–
	4A	Belay 50 WDG (clothianidin)	Soil: 4.8–6.4 oz	6.4 oz/A	12	Apply at planting	Do not release irrigation water from the treated area.
	4A	Platinum (thiamethoxam)	5–11 fl oz	11 fl oz/A or 0.172 lb a.i./A	12	30	Soil application. See label for rotational restrictions.
	4A	Platinum 75 SG (thiamethoxam)	1.66–3.67 oz	11 fl oz/A or 0.172 lb a.i./A	12	30	Soil application. See label for rotational restrictions.
	4A	Scorpion 35SL (dinotefuran)	Foliar: 2–7 fl oz Soil: 9–10.5 fl oz	10.5 fl oz/A (foliar sprays) or 21 fl oz/A (soil)	12	Foliar: 1 Soil: 21	Risk to bees and other insect pollinators.
	4A	Venom (dinotefuran)	Foliar: 1–4 oz Soil: 5.0–7.5 oz	6 oz/A (foliar) or 12 oz/A (soil)	12	Foliar: 1 Soil: 21	Use only 1 application method. No more than 3 applications per season.
	4C	Transform WG (sulfoxaflor)	2.75 oz	8.5 oz/A per year	12	1	No more than 0.070 lb a.i./A per season. No more than 2 applications per crop cycle.
	4D	Sivanto Prime (flupyradifurone)	12–14.0 fl oz	28.0 fl oz/A per year	4	1	Suppression—Chilli thrips. Reapplications at least 7 days apart.
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	13.0 fl oz/A	12	30	No more than 1 soil application per crop season. Several methods of soil application—see label.
	5	Entrust SC (spinosad)	4–8 fl oz	29 fl oz/A or 0.45 lb a.i./A per crop	4	1	No more than 6 applications per year. Do not apply to seedlings grown for transplant. OMRI-listed. ²
	5	Radiant SC (spinetoram)	6–10 fl oz	34 fl oz or 0.266 lb a.i./A per year	4	1	Reapplications at least 4 days apart. No more than 6 applications per year.
	6	Abba Ultra (abamectin)	4.0–8.0 fl oz	24 fl oz product or 0.056 lb a.i. foliarly applied per year	12	7	<i>Thrips palmi</i> . No more than 2 sequential applications.
	6	*Agri-Mek SC (abamectin)	1.7–3.5 fl oz	10.25 fl oz/A	12	7	<i>Thrips palmi</i> . 2 sequential applications per year. No more than 10.25 fl oz/A any other foliar-applied abamectin-containing product in a growing season.
	15	Rimon 0.83EC (novaluron)	12 fl oz	36 fl oz/A	12	1	Do not use with an adjuvant. No more than 2 applications targeting thrips.
	28	Exirel (cyantraniliprole)	13.5–20.5 fl oz	0.4 lb a.i./A per crop	12	1	Spray reapplications at least 5 days apart.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	28	Verimark (cyantraniliprole)	Soil at-planting or transplant tray treatment: 10–13.5 fl oz Drip, soil injection or chemigation: 10 fl oz	0.4 lb a.i./A per crop	4	1	–
	28 + 6	*Minecto Pro (cyantraniliprole + abamectin)	5.5–10 fl oz Foliage-feeding species: 10 fl oz	20 fl oz/A per calendar year	12	7	Suppression: foliage feeders
	29	Beleaf 50 SG (flonicamid)	Greenhouse: 4.2 oz	8.4 oz/A	12	0	Apply before pests reach damaging levels. Rotate MOA after 2 consecutive Beleaf applications. Reapplications at least 7 days apart. No more than 2 applications per season.
	U	Aza-Direct (azadirachtin)	1–2 pt, up to 3.5 pt if needed	–	4	0	Antifeedant, repellent, IGR. OMRI-listed. ²
	U	Azatin XL (azadirachtin)	10–21 fl oz	–	4	0	Antifeedant, repellent, IGR.
	U	BotaniGard ES (<i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	–	4	0	OMRI-listed. ² Greenhouse approved. May be mixed with some fungicides. Contact dealer for recommendations when using an adjuvant.
	U	M-Pede 49% EC (soap, insecticidal)	1%–2% v/v	–	12	0	OMRI-listed. ²
	U	METS2 EC (<i>Metarhizium anisopliae</i> strain F52)	Drench: 40–80 fl oz/100 gal Foliar: 0.5 pt–2 qt/A	–	4	0	–
	U	Molt-X (azadirachtin)	8 fl oz	–	4	0	OMRI-listed. ² Antifeedant, repellent, IGR.
	U	Mycotrol ESO (<i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	–	4	0	OMRI-listed. ² Greenhouse approved. May be mixed with some fungicides. Contact dealer for recommendations if adjuvant being used.
	U	Requiem 25EC (extract of <i>Chenopodium ambrosioides</i>)	2–4 qt	–	4	0	Begin before pest reach damaging levels.
	U	Suffoil-X (petroleum oil)	1–2 gal/100 gal of water	–	4	0	OMRI-listed. ²
	U	Surround (kaolin)	12.50–50 lb	–	4	0	12.5 is the preferred rate up to fruit set.
	U	Ultra-Fine Oil, JMS Stylet-Oil, Saf-T-Side, others (oil, insecticidal)	JMS: 3–6 qt/100 gal Others: 1–2 gal/100 gal	–	4	0	Organic Stylet-Oil and Saf-T-Side are OMRI-listed. ²

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
Weevils (including pepper weevil, vegetable weevil)	1A	*Vydate L (oxamyl)	Foliar: 2–4 pt	24 pt/A	48	7	–
	1B	Lorsban 75WG (chlorpyrifos) [24(c) label] SLN FL-040005	1.33 lb	10.64 lb per crop	24	7	Do not apply within 10 days of transplanting or to plants under severe heat or drought stress. No more than 8 applications. Reapplication at least 10 days apart.
	3A	*Ambush 25W (permethrin)	6.4–12.8 oz	1.6 lb a.i./A	12	3	Bell peppers only.
	3A	*Asana XL (0.66EC) (esfenvalerate)	5.8–9.6 fl oz	0.35 lb a.i./A or treat more than 7 times at highest rate	12	7	Aids in control.
	3A	*Baythroid XL (beta-cyfluthrin)	2.8 fl oz	16.8 fl oz/A or 0.132 lb a.i./A	12	7	Suppression.
	3A	*Brigade 2EC (bifenthrin)	2.1–6.4 fl oz	0.2 lb a.i./A	12	7	Reapplications at least 7 days apart.
	3A	*Hero (bifenthrin + zeta-cypermethrin)	4.0–10.3 oz	27.39 oz/A	12	7	Refer to label's maximum usage table when applying Hero and another product containing either of the same active ingredients.
	3A	*Karate with Zeon (lambda-cyhalothrin)	1.28–1.92 fl oz	23.04 fl oz/A or 0.36 lb a.i./A	24	5	Suppression.
	3A	*Mustang (zeta-cypermethrin)	2.4–4.3 fl oz	245.8 fl oz/A	12	1	Reapplications at least 7 days apart.
	3A	*Pounce 25 W (permethrin)	6.4–12.8 oz	0.8 lb a.i./A	12	3	Labeled for bell peppers. Reapplications at least 5 days apart.
	3A	*Warrior II (lambda-cyhalothrin)	1.28–1.92 fl oz	0.36 lb a.i./A	24	5	Suppression.
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.5 fl oz	19.0 fl oz/A	24	5	Suppression only. For control, tank-mix with 2–2.5 oz/A of Actara.
	3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	19 fl oz	57 fl oz/A of product or 0.036 lb/A of avermectin or 0.078 lb/A of z-cypermethrin per 12-month cropping year	12	7	Do not reapply this product or others containing either of the same active ingredients within 7 days.
	3A + 28	*Besiege (lambda-cyhalothrin + chlorantraniliprole)	6.0–9.0 fl oz	31.0 fl oz/A per year	24	5	Reapplications at least 5 days apart.
	4A	Assail 30SG (acetamiprid)	2.5–4.0 oz	16 oz/A of Assail 30SG per growing season, including any pretransplant application of acetamiprid	12	7	Begin applications for whitefly when first adults are noticed. No more than 4 applications per season. Reapplications at least 7 days apart.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	4A	Assail 70WP (acetamiprid)	1.1–1.7 oz	6.8 oz/A	12	7	–
	4A	Belay 50 WDG (clothianidin)	Foliar: 1.6–2.1 oz	6.4 oz/A	12	7	Do not use an adjuvant. Toxic to bees. Do not release irrigation water from the treated area.
	4A	Provado 1.6F (imidacloprid)	6.2 oz	19.2 fl oz/A per crop	12	0	Do not apply to crop treated with imidacloprid or thiamethoxam. Reapplications at least 5 days apart.
	4A	Scorpion 35SL (dinotefuran)	Foliar: 2–7 fl oz Soil: 9–10.5 fl oz	10.5 fl oz/A (foliar sprays) or 21 fl oz/A (soil)	12	Foliar: 1 Soil: 21	Risk to bees and other insect pollinators. Follow application restrictions found in the directions for use to protect pollinators. Use only 1 application method.
	15	*Dimilin 25W, *2L (diflubenzuron)	4–8 oz	24 oz/A	12	7	No more than 5 applications per season. IGR effects not seen for 5–7 days. Will not control adults; however, eggs laid by adults will exhibit reduced hatching in fruits once adults have consumed or contacted residues on plant tissue.
	15	Rimon 0.83EC (novaluron)	9–12 fl oz	36 fl oz/A	12	1	Do not use with an adjuvant. Apply at initial flowering stage.
	28	Exirel (cyantraniliprole)	13.5–20.5 fl oz	0.4 lb a.i./A per crop	12	1	Suppression only. Use as part of an effective control program. Rotate in other modes of action. Start applications when populations are low.
	28 + 6	*Minecto Pro (cyantraniliprole + abamectin)	10 fl oz	20 fl oz/A per calendar year	12	7	Suppression.
	U	Aza-Direct (azadirachtin)	1–2 pt, up to 3.5 pt if needed	–	4	0	Antifeedant, repellent, IGR. OMRI-listed. ²
	U	Azatin XL (azadirachtin)	10–21 fl oz	–	4	0	Antifeedant, repellent, IGR.
Whiteflies (adults, immatures)	U	Neemix 4.5 (azadirachtin)	4–16 fl oz	–	12	0	IGR and feeding repellent. OMRI-listed. ²
	3A	*Brigade 2EC (bifenthrin)	2.1–6.4 fl oz	0.2 lb a.i./A	12	7	Reapplications at least 7 days apart.
	3A	*Hero (bifenthrin + zeta-cypermethrin)	10.3 oz	27.39 oz/A of product or 0.266 lb a.i./A	12	7	Refer to label's maximum usage table when applying Hero and another product containing either of the same active ingredients.
	3A	*Karate with Zeon (lambda-cyhalothrin)	1.28–1.92 fl oz	23.04 fl oz or 0.36 lb a.i./A	24	5	Suppression.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	3A	*Warrior II (lambda-cyhalothrin)	1.28–1.92 fl oz	0.36 lb a.i./A	24	5	Suppression.
	3A + 4A	*Endigo ZC (lambda-cyhalothrin + thiamethoxam)	4.5 fl oz	19.0 fl oz/A	24	5	Suppression only. For control, tank-mix with 2–2.5 oz/A of Actara.
	3A + 6	*Gladiator (zeta-cypermethrin + avermectin B1)	19 fl oz	57 fl oz/A of product or 0.036 lb/A of avermectin or 0.078 lb/A of z-cypermethrin per 12-month cropping year	12	7	Do not reapply this product or others containing either of the same active ingredients within 7 days.
	3A + 28	*Besiege (lambda-cyhalothrin + chlorantraniliprole)	6.0–9.0 fl oz	31.0 fl oz/A per year	24	5	Reapplications at least 5 days apart. Suppression only.
	4A	Actara (thiamethoxam)	3.0–5.5 oz	11 oz/A	12	0	Toxic to bees.
	4A	Admire Pro (imidacloprid)	7–14.0 fl oz	14.0 fl oz/A	12	Soil: 21	Most effective if applied to soil at transplanting.
	4A	Admire Pro (imidacloprid)	0.44 fl oz/10,000 plants	–	12	Soil: 21	Planthouse: 1 application to transplants. See label.
	4A	Assail 30SG (acetamiprid)	2.5–4.0 oz	16 oz/A of Assail 30SG per growing season, including any pretransplant applications of acetamiprid.	12	7	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)	1.1–1.7 oz	6.8 oz/A of Assail 70WP per growing season, including any pretransplant applications of acetamiprid	12	7	–
	4A	Belay 50 WDG (clothianidin)	Foliar: 1.6–3.2	6.4 oz/A	12	7	Suppression. 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	Do not release irrigation water from the treated area.
	4A	Platinum (thiamethoxam)	5–11 fl oz	11 fl oz/A or 0.172 lb a.i./A	12	30	Soil application. See label for rotational restrictions.
	4A	Platinum 75 SG (thiamethoxam)	1.66–3.67 oz	11 fl oz/A	12	30	Soil application. See label for rotational restrictions.
	4A	Provado 1.6F (imidacloprid)	3.8–6.2 oz	19.2 fl oz/A per crop	12	0	Do not apply to crop treated with imidacloprid or thiamethoxam. Reapplication at least 5 days apart.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	4A	Scorpion 35SL (dinotefuran)	Foliar: 2–7 fl oz Soil: 9–10.5 fl oz	10.5 fl oz/A (foliar sprays) or 21 fl oz/A (soil)	12	Foliar: 1 Soil: 21	Risk to bees and other insect pollinators. Follow application restrictions found in the directions for use to protect pollinators. Use only 1 application method.
	4A	Venom (dinotefuran)	Foliar: 1–4 oz Soil: 5.0–7.5 oz	6 oz/A (foliar) or 12 oz/A (soil)	12	Foliar: 1 Soil: 21	Use only 1 application method (soil or foliar). No more than 3 applications per season.
	4A + 28	Durivo (thiamethoxam + chlorantraniliprole)	10–13 fl oz	13.0 fl oz/A of product or 0.172 lb/A thiamethoxam or 0.2 lb/A chlorantraniliprole	12	30	No more than 1 soil application per crop season. Several methods of soil application—see label.
	4A + 28	Voliam Flexi (thiamethoxam + chlorantraniliprole)	4–7 oz	14 oz/A of product	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)	2.0–2.25 oz	0.070 lb a.i./A or a total of 8.5 oz/A per year	12	1	No more than 2 applications per crop cycle.
	4D	Sivanto Prime (flupyradifurone)	10.5–14.0 fl oz	28.0 fl oz/A per year	4	1	Reapplications at least 7 days apart.
	7C	Knack IGR Section 2(ee) #59639-95 FL (pyriproxyfen)	5 fl oz	20 fl oz/A	12	1	Immatures only. Apply when nymphs first appear. Alternate or mix application with active ingredient of different mode of action.
	9B	Fulfill (pymetrozine)	2.75 oz	5.5 oz/A per crop	12	0	Suppression. No more than 2 applications.
	9D	Sefina Inscalis Insecticide (afidopyropen)	14.0 fl oz	28 fl oz/A	12	0	No more than 2 sequential applications per year before using a different mode of action.
	15	Rimon 0.83EC (novaluron)	12 fl oz	36 fl oz/A	12	1	Do not use with an adjuvant. No more than 2 applications targeting whitefly.
	16	Courier SC (buprofezin)	9.0–13.6 fl oz	27.2 fl oz/A per crop cycle	12	1	Immatures only. Slow-acting IGR that will not kill nymphs immediately. No more than 2 applications per season. Reapplications at least 5 days apart.
	21A	Portal (fenpyroximate)	2.0 pt	4.0 pt/A per crop cycle	12	1	Suppression. No more than 2 applications per season. Reapplications at least 14 days apart.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient)	Rate Product/Acre	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	23	Movento (spirotetramat)	4.0–5.0 fl oz	10 fl oz/A	24	1	Reapplications at least 7 days apart.
	23	Oberon 2SC (spiromesifen)	7.0–8.5 fl oz	25.5 fl oz/A per crop	12	1	No more than 3 applications.
	28	Exirel (cyantraniliprole)	13.5–20.5 fl oz	0.4 lb a.i./A per crop.	12	1	Spray reapplications at least 5 days apart.
	28	Verimark (cyantraniliprole)	Soil at-planting or transplant tray treatment: 6.75–13.5 fl oz Drip, soil injection or chemigation: 6.75–10 fl oz	0.4 lb a.i./A per crop	4	1	–
	28 + 6	*Minecto Pro (cyantraniliprole + abamectin)	10 fl oz	20 fl oz/A per calendar year	12	7	–
	28 + 16	Vetica (flubendiamide + buprofezin)	12.0–17.0 fl oz	38 fl oz/A	12	1	No more than 3 times per season. Use 14–17 fl oz/A to control whiteflies.
	29	Beleaf 50 SG (flonicamid)	2.8–4.2 oz	8.4 oz/A	12	0	Reapplications at least 7 days apart. No more than 2 applications per season.
	U	Azatin XL (azadirachtin)	10–21 fl oz	–	4	0	Antifeedant, repellent, IGR.
	U	METS2 EC (<i>Metarhizium anisopliae</i> strain F52)	Drench: 40–80 fl oz/100 gal Foliar: 0.5 pt–2 qt/A	–	4	0	–
	U	Requiem 25EC (extract of <i>Chenopodium ambrosioides</i>)	2–3 qt	–	4	0	Begin before pests reach damaging levels.

¹Mode 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. U = unknown, or a mode of action that has not been classified yet.

²Information 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 5. Pepper 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, Kantan DF, Kocide 2000, Kocide 3000, Kocide DF, Nordox, Nordox 75WG, Nu Cop 3L, Nu Cop 50DF, Nu Cop 50WP, Nu Cop HB, Previsto	SEE INDIVIDUAL LABELS	SEE INDIVIDUAL LABELS	1	Varies by product from 4 hr to 2 days	–
	M1 + M3	Mankocide (copper hydroxide + mancozeb)	3 lb	39 lb	7	2	–
	M3	(mancozeb) Many brands available: Dithane F45, Dithane M45, Koverall, Manzate MAX, Manzate Pro-Stik, Penncozeb 75DF, Roper DF	SEE INDIVIDUAL LABELS	SEE INDIVIDUAL LABELS	7	1	–
	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo Zn, Chloronil 720, Echo 720, Echo 90 DF, Echo Zn, Equus 500 Zn, Equus 720 SST, Equus DF, Initiate 720	SEE INDIVIDUAL LABELS	SEE INDIVIDUAL LABELS	3	1	–
	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.

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-to-10-day interval before rotating to a non-FRAC group 7 fungicide. No more than 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use.
	7 + 3	Luna Flex	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.
	9 + 3	Inspire Super Vango ESQ Inspire Super (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, Azoxystrobin, Azteroid FC, Dynasty, Gold Rush, Heritage, Mazolin, Quadris FL, Satori, TetraBan, Trevo, Willowood Azoxy 2SC	SEE INDIVIDUAL LABELS	SEE INDIVIDUAL LABELS	0	4 hr	Must alternate or tank-mix with a fungicide from a different FRAC group; see specific label for mixing instructions and precautions.
	11	Cabrio 2.08 F (pyraclostrobin)	16 fl oz	96 fl oz	0	0.5	No more than 6 applications of Cabrio or other group 11 fungicides/season.
	11	Flint 50 WGD (trifloxystrobin)	4 oz	16 oz	3	0.5	No more than 4 applications per season. Alternate with a fungicide from a different FRAC group. Suppression.
	11 + M3	Dexter Max (azoxystrobin + mancozeb)	3.4 lb	20.5 lb	7	2	No more than 1 application before alternating to a non-FRAC group 11 fungicide.
	11 + 3	Quadris Top (azoxystrobin + difenoconazole)	14 fl oz	55.3 fl oz	0	0.5	No more than 4 applications per season. No more than 2 sequential applications. Use of a spreading- or penetrating-type adjuvant may enhance efficacy. Not labeled for transplants. 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.
	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.
	11 + 27	Tanos (famoxadone + cymoxanil)	10 oz	72 oz	3	0.5	Tank-mix with contact fungicides. Tank-mix or rotate with a fungicide from a different FRAC group.
	19	Ph-D WDG (polyoxin D zinc salt)	6.2 oz	31.0 oz	0	4 hr	No more than 5 applications in a 10-to-14-day interval. Alternate with a fungicide from a different FRAC group. Suppression.
	27 + M5	Ariston Cymbol Advance (cymoxanil + chlorothalonil)	2.44 pt	17.5 pt	3	0.5	–
	49 + M5	Orondis Opti (oxathiapiprolin + chlorothalonil)	2.5 pt	10 pt	3	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.
Bacterial spot	M1	(copper compounds) Many brands available: Americop 40 DF, Badge SC, Badge X2, Basic Copper 50W HB, Basic Copper 53, Champ DP, Champ F2 FL, Champion WP, Champ WG, C-O-C DF, C-O-C-S WDG, C-O-C WP, Copper Count N, Cueva, Cuprofix Ultra 40D, Kentan DF, Kocide 2000, Kocide 3000, Kocide DF, Nordox, Nordox 75WG, Nu Cop 3L, Nu Cop 50DF, Nu Cop 50WP, Nu Cop HB, Previsto	SEE INDIVIDUAL LABELS	SEE INDIVIDUAL LABELS	1	Varies by product from 4 hr to 2 days	For best possible chemical control of bacterial spot, tank-mix copper with a mancozeb fungicide.
	M1 + M3	Mankocide (copper hydroxide + mancozeb)	3 lb	39 lb	7	2	–

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 F45, Dithane M45, Koverall, Manzate MAX, Manzate Pro-Stik, Penncozeb 75DF, Roper DF	SEE INDIVIDUAL LABELS	SEE INDIVIDUAL LABELS	7	1	Bacterial spot control only when tank-mixed with a copper fungicide. Use of 1 lb/A of mancozeb per application is sufficient.
	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)	3.4 lb	20.5 lb	7	2	Combine with a fixed-copper fungicide. Limit is a single application before alternating to a non-FRAC group 11 fungicide.
	11 + 27	Tanos (famoxadone + cymoxanil)	10 oz	72 oz	3	0.5	Tank-mix with contact fungicides. Tank-mix or rotate with a fungicide from a different FRAC group. Tank-mix with copper fungicides for suppression of Phytophthora blight, bacterial spot, and bacterial soft rot.
	13	Quintec (quinoxifen)	6 fl oz	24 fl oz	3	0.5	Supplemental Section 2(ee) label: Must be alternated with another product effective against bacterial spot. If multiple applications are made, at least 1 application must be a tank mix with another product effective against bacterial spot. Suppression.
	21	*Actigard (acibenzolar-S-methyl)	0.75 oz	6 oz	14	0.5	Labelled for chili pepper only. Begin applications within 1 week of transplanting or emergence. No more than 8 weekly sequential applications.
Bacterial soft rot (suppression)	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.
	11 + 27	Tanos (famoxadone + cymoxanil)	10 oz	72 oz	3	0.5	Tank-mix with contact fungicides. Tank-mix or rotate with a fungicide from a different FRAC group. Suppression.
	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.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
Botrytis or Gray mold	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo Zn, Chloronil 720, Echo 720, Echo 90 DF, Echo Zn, Equus 500 Zn, Equus 720 SST, Equus DF, Initiate 720	SEE INDIVIDUAL LABELS	SEE INDIVIDUAL LABELS	3	1	–
	7	Endura (boscalid)	3.5 oz	21 oz	0	0.5	No more than 6 applications per season at lower rate. No more than 2 sequential applications before alternating with another effective fungicide from another FRAC group. Suppression.
	7	Fontelis (penthiopyrad)	24 fl oz	72 fl oz	0	0.5	For disease suppression only. No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. See label for additional instructions pertaining to greenhouse usage.
	7 + 3	Luna Flex	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.
	7 + 12	Miravis Prime (pydiflumetofen + fludioxonil)	11.4 fl oz	22.8 fl oz	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC group 7 or non-FRAC group 12 fungicide. No more than 2 applications at maximum rate per year. Can be applied via chemigation in 0.1–0.25 inches/A of water. Not for use in transplant or greenhouse production. Suppression.
	9	Vango (cyprodinil)	7 oz	28 oz	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC group 9 for at least 2 sequential applications. No more than 4 applications per year. Can be applied via chemigation.
	9 + 3	Inspire Super Vango ESQ (cyprodinil + difenoconazole)	20 fl oz	80 fl oz	0	0.5	No more than 2 sequential applications before rotating with 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	0	0.5	No more than 56 oz per year. After 2 applications of Switch, alternate with another effective fungicide from a different FRAC group.
	11	Cabrio 2.08 F (pyraclostrobin)	16 fl oz	96 fl oz	0	0.5	No more than 6 applications of Cabrio or other group 11 fungicides per season. Suppression.
	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.
	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.
	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 (polyoxin D zinc salt)	6.2 oz	31.0 oz	0	4 hr	No more than 5 applications on 10-to-14-day interval. Alternate with a fungicide from a different FRAC group.
	27 + M5	Ariston Cymbol Advance (cymoxanil + chlorothalonil)	2.44 pt	17.5 pt	3	0.5	–
	49 + M5	Orondis Opti (oxathiapiprolin + chlorothalonil)	2.5 pt	10 pt	3	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	
Frogeye leaf spot, Cercospora leaf spot (<i>Cercospora</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 75WG, Nu Cop 3L, Nu Cop 50DF, Nu Cop 50WP, Nu Cop HB, Previsto	SEE INDIVIDUAL LABELS	SEE INDIVIDUAL LABELS	1	Varies by product from 4 hr to 2 days	For best possible chemical control of bacterial spot, a copper fungicide should be tank-mixed with a mancozeb fungicide.
	M1 + M3	Mankocide (copper hydroxide + mancozeb)	3 lb	39 lb	7	2	–
	M3	(mancozeb) Many brands available: Dithane F45, Dithane M45, Koverall, Manzate MAX, Manzate Pro-Stik, Penncozeb 75DF, Roper DF	SEE INDIVIDUAL LABELS	SEE INDIVIDUAL LABELS	7	1	–
	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo Zn, Chloronil 720, Echo 720, Echo 90 DF, Echo Zn, Equus 500 Zn, Equus 720 SST, Equus DF, Initiate 720	SEE INDIVIDUAL LABELS	SEE INDIVIDUAL LABELS	3	1	–
	3	Indar 2F (fenbuconazole)	12 fl oz	48 fl oz	7	0.5	No more than 2 consecutive applications before alternating with a fungicide from another FRAC group. A 35-to-210-day plant-back interval exists for nonlabeled crops.
	3	Rhyme (flutriafol)	7 fl oz	28 fl oz	0	0.5	No more than 4 applications per season.
	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-to-10-day interval before rotating to a non-FRAC group 7 fungicide. 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.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	11 + M3	Dexter Max (azoxystrobin + mancozeb)	3.4 lb	20.5 lb	7	2	No more than 1 application before alternating to a non-FRAC group 11 fungicide.
	11 + 3	Quadris Top (azoxystrobin + difenoconazole)	14 fl oz	55.3 fl oz	0	0.5	No more than 4 applications per season. No more than 2 sequential applications. Use of a spreading- or penetrating-type adjuvant may enhance efficacy. Not labeled for transplants. 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.
	27 + M5	Ariston Cymbol Advance (cymoxanil + chlorothalonil)	2.44 pt	17.5 pt	3	0.5	–
	49 + M5	Orondis Opti (oxathiapiprolin + chlorothalonil)	2.5 pt	10 pt	3	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.
Gray leaf spot (<i>Stemphyllium</i> spp.)	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 + 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-to-10-day interval before rotating to a non-FRAC group 7 fungicide. 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.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	7 + 11	Luna Sensation (fluopyram + trifloxystrobin)	7.6 fl oz	27.3 fl oz	3	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. 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 at maximum rate per year. Can be applied via chemigation in 0.1–0.25 inches/A of water. Not for use in transplant or greenhouse production.
	9 + 3	Inspire Super 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 50 WGD (trifloxystrobin)	4 oz	16 oz	3	0.5	No more than 4 applications per season. Alternate with a fungicide from a different FRAC group.
	11 + 3	Quadris Top (azoxystrobin + difenoconazole)	14 fl oz	55.3 fl oz	0	0.5	No more than 4 applications per season. No more than 2 sequential applications. Use of a spreading- or penetrating-type adjuvant may enhance efficacy. Not labeled for transplants. Up to a 1-year plant-back restriction for certain off-label crops.
	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 LABELS	SEE INDIVIDUAL LABELS	1	1	Follow label closely; sulfur may cause phytotoxicity.
Powdery mildew	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo Zn, Chloronil 720, Echo 720, Echo 90 DF, Echo Zn, Equus 500 Zn, Equus 720 SST, Equus DF, Initiate 720	SEE INDIVIDUAL LABELS	SEE INDIVIDUAL LABELS	3	1	–
	3	Cevya Provyosol (mefentrifluconazole)	5 fl oz	15 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	
	3	Inder 2F (fenbuconazole)	12 fl oz	48 fl oz	7	0.5	No more than 2 sequential applications before alternating with a fungicide from a different FRAC group. A 35-to-210-day plant-back interval exists for nonlabeled crops.
	3	Rally Sonoma 40WSP (myclobutanol)	5 oz	20 oz	0	1	No more than 4 applications per season on a 10-to-14-day treatment interval. Should be alternated or tank-mixed with a fungicide from a different FRAC group.
	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 (penthioopyrad)	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	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	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-to-10-day interval before rotating to a non-FRAC group 7 fungicide. 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.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	7 + 11	Luna Sensation (fluopyram + trifloxystrobin)	7.6 fl oz	27.3 fl oz	3	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. 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 at maximum rate per year. Can be applied via chemigation in 0.1–0.25 inches/A of water. Not for use in transplant or greenhouse production.
	9	Vango (cyprodinil)	7 oz	28 oz	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC group 9 for at least 2 sequential applications. No more than 4 applications per year. Can be applied via chemigation.
	9 + 3	Inspire Super Vango ESQ (cyprodinil + difenoconazole)	20 fl oz	80 fl oz	0	0.5	No more than 2 sequential applications before rotating to another effective fungicide from another FRAC group.
	9 + 12	Alterity 62.5WG Switch 62.5WG (cyprodinil + fludioxonil)	14 oz	56 oz	0	0.5	No more than 56 oz per year. After 2 applications of Switch, alternate with another effective fungicide from a different FRAC group.
	11	(azoxystrobin) Many brands available: AFrame, Arius, AzoxyStar, Azoxystrobin 100ST, Azoxystrobin, Azteroid FC, Dynasty, Gold Rush, Heritage, Mazolin, Quadris FL, Satori, TetraBan, Trevo, Willowood Azoxy 2SC	SEE INDIVIDUAL LABELS	SEE INDIVIDUAL LABELS	0	4 hr	Must alternate or tank-mix with a fungicide from a different FRAC group; see specific label for mixing instructions and precautions.
	11	Flint 50 WGD (trifloxystrobin)	4 oz	16 oz	3	0.5	No more than 4 applications per season. Alternate with a fungicide from a different FRAC group.
	11 + M3	Dexter Max (azoxystrobin + mancozeb)	3.4 lb	20.5 lb	7	2	No more than 1 application before alternating to a non-FRAC group 11 fungicide. Suppression.

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)	14 fl oz	55.3 fl oz	0	0.5	No more than 4 applications per season. No more than 2 sequential applications. Use of a spreading- or penetrating-type adjuvant may enhance efficacy. Not labeled for transplants. 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.
	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	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.
	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.
	13	Quintec (quinoxifen)	6 fl oz	24 fl oz	3	0.5	Will not control latent or established infections. Must alternate or tank-mix with an effective fungicide from a different FRAC group.
	19	Ph-D WDG (polyoxin D zinc salt)	6.2 oz	31.0 oz	0	4 hr	No more than 5 applications on 10-to-14-day intervals. Alternate with a fungicide from a different FRAC group.
	27 + M5	Ariston Cymbol Advance (cymoxanil + chlorothalonil)	2.44 pt	17.5 pt	3	0.5	–
	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.

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	3	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.
	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.
Phytophthora blight, Phytophthora root rot, Phytophthora crown rot (<i>Phytophthora</i> spp.)	M1	(copper compounds) Many brands available: Americop 40 DF, Badge SC, Badge X2, Basic Copper 50W HB, Basic Copper 53, Champ DP, Champ F2 FL, Champion WP, Champ WG, C-O-C DF, C-O-C-S WDG, C-O-C WP, Copper Count N, Cueva, Cuprofix Ultra 40D, Kentan DF, Kocide 2000, Kocide 3000, Kocide DF, Nordox, Nordox 75WG, Nu Cop 3L, Nu Cop 50DF, Nu Cop 50WP, Nu Cop HB, Previsto	SEE INDIVIDUAL LABELS	SEE INDIVIDUAL LABELS	1	Varies by product from 4 hr to 2 days	–
	M1 + M3	Mankocide (copper hydroxide + mancozeb)	3 lb	39 lb	7	2	Suppression.
	M3	(mancozeb) Many brands available: Dithane F45, Dithane M45, Koverall, Manzate MAX, Manzate Pro-Stik, Penncozeb 75DF, Roper DF	SEE INDIVIDUAL LABELS	SEE INDIVIDUAL LABELS	7	1	–

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	4	Metastar 2E ReCon 4F ReCon Bold SL Xylem FC (metalaxyl)	Metastar: 8 qt ReCon 4F: 4 qt ReCon SL: 1 pt Xylem: 4 qt	Metastar: 12 qt ReCon 4F: 6 qt ReCon SL: 3 pt Xylem: 4.3 qt	2	7	Must be soil applied. See labels.
	4	Ridomil Gold SL Ultra Flourish (mefenoxam)	Ridomil: 1 pt Ultra: 2 pt	Ridomil: 3 pt Ultra: 6 pt	7	2*	No more than 1.5 lb/A of mefenoxam per crop to the soil. *There is a reentry interval exemption if material is soil-injected or soil-incorporated.
	4 + M1	Ridomil Gold Copper 64.8 W (mefenoxam + copper hydroxide)	2.5 lb	10 lb	7	2	–
	11	Reason 500 SC (fenamidone)	8.2 fl oz	24.6 fl oz	14	0.5	Ground application only. Must alternate with a fungicide from a different FRAC group. See supplemental label for restrictions and details. Suppression.
	11 + M3	Dexter Max (azoxystrobin + mancozeb)	3.4 lb	20.5 lb	7	2	No more than 1 application before alternating to a non-FRAC group 11 fungicide.
	11 + 27	Tanos (famoxadone + cymoxanil)	10 oz	72 oz	3	0.5	Tank-mix with contact fungicides. Tank-mix or rotate with a fungicide from a different FRAC group. Suppression.
	21	Ranman (cyazofamid)	2.75 fl oz	16.5 fl oz	0	0.5	No more than 6 applications per crop. Must be rotated with an effective fungicide from a different FRAC group. See label for application instructions, including the recommended use of specific surfactants.
	21	Segway O Ranman (cyazofamid)	3.2 fl oz/100 gal	13.5 fl oz/plant	0	–	Greenhouse production only; apply at transplant or up to first fruit set, followed by second application 42 days later. Soil drench only. Do not use any surfactant.
	22	Elumin (ethaboxam)	8 fl oz	16 fl oz	2	0.5	No more than 2 applications per year. Reapplications at least 14 days apart. Do not apply sequentially. Alternate with an effective fungicide from a different FRAC group. See label of additional instructions for foliar and soil applications.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	28	Previcur Flex Promess (propamocarb hydrochloride)	SEE INDIVIDUAL LABELS	SEE INDIVIDUAL LABELS	5	0.5	Greenhouse application: No more than 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)	1.2 pt	6 pt	5	0.5	Field application: Apply prior to infection when conditions are favorable for disease.
	29	Omega 500F Orbus 4F Oxelid Lektivar Vantana (fluazinam)	24 fl oz	144 fl oz	30	0.5	Apply as soil drench at transplant. Start foliar applications 7 days after transplant and reapply on 7- to 14- day interval. No more than 9 applications per year.
	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 LABELS	SEE INDIVIDUAL LABELS	-	4 hr	See specific label for mixing instructions and precautions.
	40	Forum (dimethomorph)	6 oz	30 oz	0	0.5	Apply with another fungicide from a different FRAC group.
	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. Suppression.
	40	Revus (mandipropamid)	8 fl oz	32 fl oz	1	4 hr	No more than 2 sequential applications. Alternate with another effective fungicide. 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.
	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	3	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 + 4	Orondis Gold (oxathiapiprolin + mefenoxam)	55 fl oz	55 fl oz	0	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. Not labeled for greenhouse use.
Pythium damping-off, Pythium root rot, or Pythium seedling blights (<i>Pythium</i> spp.)	4	Allegiance-FL Acquire (metalaxyl)	0.75 fl oz/100 lb seed	–	–	–	Seed treatment only.
	4	Apron XL (mefenoxam)	0.64 fl oz/100 lb seed	–	–	–	Seed treatment only.
	4	Metastar 2E ReCon 4F ReCon Bold SL Xyler FC (metalaxyl)	Metastar: 8 qt ReCon 4F: 4 qt ReCon SL: 1 pt Xyler: 4 qt	Metastar: 12 qt ReCon 4F: 6 qt ReCon SL: 3 pt Xyler: 4.3 qt	2	7	Must be soil applied. See labels.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
	4	Ridomil Gold SL Ultra Flourish (mefenoxam)	Ridomil: 1 pt Ultra: 2 pt	Ridomil: 3 pt Ultra: 6 pt	7	2*	No more than 1.5 lb/A of mefenoxam per crop to the soil. *There is a reentry interval exemption if material is soil-injected or soil-incorporated.
	4 + M1	Ridomil Gold Copper 64.8 W (mefenoxam + copper hydroxide)	2.5 lb	10 lb	7	2	Use Ridomil Gold EC on soil preplant or at planting. Make up to 2 additional applications. Use 1 pt/A and apply at a 30-day interval.
	12	Maxim 4 FS (fludioxonil)	0.16 fl oz/100 lb seed	–	–	–	Seed treatment only. Suppression.
	21	Ranman Segway O (cyazofamid)	3.2 fl oz/100 gal	13.5 fl oz/plant	0	–	Greenhouse production only; apply at transplant or up to first fruit set, followed by second application 42 days later. Soil drench only. Do not use any surfactant.
	28	Previcur Flex Promess (propamocarb hydrochloride)	1.2 pt	6 pt	5	0.5	Apply prior to infection when conditions are favorable for disease. See label for greenhouse applications.
	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 LABELS	SEE INDIVIDUAL LABELS	–	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.
	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-to-10-day interval before rotating to a non-FRAC group 7 fungicide. No more than 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use.
	Rhizoctonia solani						

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
Southern blight (<i>Sclerotium rolfsii</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 Azoxystrobin 2SC	SEE INDIVIDUAL LABELS	SEE INDIVIDUAL LABELS	0	4 hr	Must alternate or tank-mix with a fungicide from a different FRAC group; see specific label for mixing instructions and precautions.
	11	Cabrio 2.08 F (pyraclostrobin)	16 fl oz	96 fl oz	0	0.5	No more than 6 applications of Cabrio or other group 11 fungicides per season.
	11 + 3	Veltyrna (pyraclostrobin + mefentrifluconazole)	10 fl oz	30 fl oz	0	0.5	No more than 3 applications per year.
	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-to-10-day interval before rotating to a non-FRAC group 7 fungicide. No more than 4 applications per year. See label for surfactant precautions. Not labeled for greenhouse use. Suppression.
	11	Aftershock Evito Tepera (fluoxastrobin)	Aftershock, Evito: 5.7 fl oz Tepera: 12.6 fl oz	Aftershock, Evito: 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	Cabrio 2.08 F (pyraclostrobin)	16 fl oz	96 fl oz	0	0.5	No more than 6 applications of Cabrio or other group 11 fungicides per season.
	11 + IRAC 3	Tepera Plus (fluoxastrobin + bifenthrin)	15.4 fl oz	61.6 fl oz	7	0.5	Contains bifenthrin insecticide. No more than 4 applications per year. Reapplications at least 7 days apart. No use in greenhouse.
	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.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ³
			Appl.	Season ²	Harvest	Reentry	
White mold (<i>Sclerotinia sclerotiorum</i>) (suppression)	7 + 11	Luna Sensation (fluopyram + trifloxystrobin)	7.6 fl oz	27.3 fl oz	3	0.5	No more than 2 sequential applications before rotating with another effective fungicide from a different FRAC group. No more than 5 applications per a year.
	11	Cabrio 2.08 F (pyraclostrobin)	16 fl oz	96 fl oz	0	0.5	No more than 6 applications of Cabrio or other group 11 fungicides per season.
	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. White mold suppression only.
¹ FRAC code (fungicide group): Number (1 –54) and letters are used to distinguish the fungicide mode of action groups. All fungicides within the same group (with the same number or letter) indicate the same active ingredient or similar mode of action. This information must be considered for the 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 2024; http://www.frac.info/ (FRAC = Fungicide Resistance Action Committee). ² Always double-check labels regarding maximum application limits. Many labels are changing from a maximum rate per a season (or crop cycle) to a maximum rate per a year. ³ Information provided in this table applies only to Florida. Be sure to read a current product label before applying any chemical. The use of brand names and any mention or listing of commercial products or services in the publication does not imply endorsement by UF/IFAS Extension nor discrimination against similar products or services not mentioned.							

Table 6. Nonfumigant nematicides for peppers in Florida.

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 leafy vegetables and brassica crops, onions, bananas, sugarcane, and other 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. Reapplications at least 5 days apart. No more than 13.7 fl oz/A of Velum (0.446 lb/A of 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. fluzaindolizine)	Apply 30.7–61.4 fl oz/A (1–2 lb a.i./A) as pre-plant incorporated, via preplant drip, or via atplant 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. Re-entry interval is 12 hr. Reapplications at least 14 days apart. Pre-harvest 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 for how to best apply them (see specific label recommendations); when nematode pressure is high, they may not be as consistently effective against root nematodes as the fumigants.	

Table 7. Fumigant nematicides for peppers in Florida. Contact: Johan Desaeger, UF/IFAS Gulf Coast Research and Education Center.

Nematicide	Broadcast Application ¹		In-the-Row Applications
	Gallons per Acre	fl oz/1000 ft/chisel-spaced 12" apart	
Telone II ^{2,3}	9–12	26–35	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-17 ^{2,3}	10.8–17.1	31.8– to 50.2	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}	13–20.5	38–60	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}	13–20.5	–	For drip fumigation, consult the product label for overall rate, drip concentration, and flow-modifying application directions.
Pic Clor 60 ^{2,3}	19.531.5	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 or in-row 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 or in-row 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.

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

²All 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).

³Higher 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.