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Chapter 7. Cucurbit Production[1]

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Botany and Planting

Angled or ridged luffa (silk squash, Chinese okra)—*Luffa acutangula*

Bittermelon (Chinese and Indian types)—*Momordica charantia*

Butternut squash—*Cucurbita moschata*

Cantaloupe—*Cucumis melo*

Chayote—*Sechium edule*

Chinese cucumber—*Trichosanthes kirilowii*

Cucumber—*Cucumis sativus,* Cucurbitaceae

Fuzzy melon (immature fruit) and **Winter melon**—*Benincasa hispida*

Long gourd (oopoh)—*Lagenaria siceraria*

Pumpkin (jack-o-lantern is *C. pepo*; some processing pumpkins are *C. maxima* and *C. moschata*)

Smooth luffa—*Luffa aegyptica* (cylindrical)

Snake gourd—*Trichosanthes cucumerina*

Summer squash (crookneck and straight-neck yellow squash)—*Cucurbita pepo*

Tropical pumpkin (calabaza)—*Cucurbita moschata*

Watermelon—*Citrullus lanatus*

Winter squash—*Cucurbita maxima*

Zucchini—*Cucurbita pepo*

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Table 1. Planting dates for cucurbits.

Planting Region	Dates				
	Cucumber	Cantaloupe	Pumpkin	Squash	Watermelon
North Florida	Feb–Apr; July–Aug	Feb–Apr	Early July	Feb–Apr; Aug–Sept	Feb–Apr
Central Florida	Jan–Mar; Sept	Jan–Mar	Mid-July	Jan–Apr; Aug–Sept	Jan–Mar
South Florida	Sept–Feb	Dec–Mar	Early August	Aug–Mar	Dec–Mar

Table 2. Planting information for cucurbits.

Planting Parameters	Measurements					
	Cucumber	Cantaloupe	Pumpkin	Squash		Watermelon
				Bush	Vining	
Distance between rows (in)	48–60	60–72	60–108	36–48	60–108	60–108
Distance between plants (in)	6–12	20–36	36–60	12–24	36–60	24–48
Seeding depth (in)	0.5–0.75	0.5–1.0	1.5–2.0	1.0–1.5	1.5–2.0	1.5–2.0
Seed per acre (lb)	2–4	1–2	4–5	2–3	1–1.5	1–3
Days to maturity from seed	40–65	85–110	80–100	40–50	85–120	80–100
Days to maturity from transplant	NR	70–90	NR	NR	NR	60–90
Plant populations (acre)	21,780	4,356	2,904	11,616	2,904	1,815
NR = Not Recommended						

Cultivars

Table 3. Cultivars for cantaloupe.

Cantaloupe	Cultivars
Eastern Shipper	Accolade (H), Ariel (H), Athena (H), Atlantis (H), Avatar (H)
Harper Type	Caribbean Gold (H), Damaris (H), Infinite Gold (H), Timeless Gold (H)
Calabaza (Tropical Pumpkin)	Agriset 9001 (vining type), La Estrella (compact plant)
H=hybrid	

Table 4. Cultivars for cucumber.

Cucumber	Cultivars
Pickling	Calypso (H) (GY), Deli King, Deli Star, Excursion, Expedition (H), Jackson Classic (H) (GY), Jackson Supreme, Maxi Pack (H), Maxi Pick (H), Powerpak (H) (GY), Supremo (H)
Slicing	Bristol, Cobra (H) (GY), Diamondback (H), Dominator (H) (GY), Impact (H) (GY), Mamba (H) (GY), Mongoose (H) (GY), Python (H), Speedway (H) (GY), SV3462CS* (H) (GY), SV4719CS* (H) (GY)
H=hybrid; flower habit: GY=gynoecious *Improved downy mildew resistance	

Table 5. Cultivars for Halloween pumpkin (north Florida only).

Halloween pumpkin (by size)	Cultivars
Miniature: < 1 lb	Bumpkin (H), Gold Dust (H), Jill-Be-Little, Wee-Be-Little (PVP)
Small: 1–5 lb	Hybrid Pam (H), Pick-A-Pie (H), Small Sugar
Medium: 5–10 lb	Autumn Gold (H), Goose Bumps II (H), Jack of All Trades (H), Knucklehead (H), Merlin (H), October (H)
Large: 10–20 lb	Apogee (H), Connecticut Field, Early Giant (H), Early King (H), Magician (H), Magic Wand (H)
Giant: 25–80 lb	Dill's Atlantic Giant, Prizewinner (H)
PVP=Plant Variety Protection; H=hybrid	

Table 6. Cultivars for squash.

Squash	Cultivars
Summer (yellow)	Conqueror III (H) (SN)*, Enterprise (H) (SN), Fortune (H) (SN), Gentry (H) (CN), Goldprize (H) (SN), Gold Star (H) (CN), Grand Prize (H) (SN), Lazor (H) (SN), Lioness (H) (SN), Smooth Criminal (H) (SN)
Acorn	Mesa Queen (H), Royal Ace (H), Table Ace (H), TayBelle PM (H)
Butternut	Atlas (H), Avalon (H), Butternut (H), Canesi (H), Early Polaris (H), Quantam (H), Ultra (H), Waltham, Zenith (H)
Summer (zucchini)	Cash Machine, Everglades (H), Green Machine (H), Pascola (H), Paycheck (H), Payload (H), Payroll (H), Renegade (H), Respect (H), Senator (H), Spineless Beauty (H), Spineless King (H), Spineless Perfection (H)
Summer (yellow zucchini)	Golden Delight (H) (SN), Golden Glory (H) (SN), Goldrush (H) (SN)

H=hybrid; type: CN=crookneck, SN=straightneck
*Biotech: Specific requirements and restrictions apply to these products.

Table 7. Cultivars for watermelon.

Watermelon	Cultivars
Diploid	Estrella (H), Jamboree (H), Mardi Gras (H), Sangria (H), Sentinel (H), Starbrite (H), Stargazer (H), SSX 8585 (H), Summer Flavor 720, Summer Flavor 790 (H), Summer Flavor 800 (H), Summer Flavor 8490 (H), Summer Flavor 860, Top Gun (H)
Triploid (seedless, large)	ACX 6177 (H), Black Jack (H), Bottle Rocket (H), Captivation (H), Crisp N' Sweet (H), Crunchy Red (H), Embassy (H), Exclamation (H), Excursion (H), Fascination (H), Joy Ride (SV 8298) (H), Kingman (H), Melody (H), Red Amber (H), Red Garnet (H), Road Trip (H), Secretariat (H), SS 7167 (H), SS 7177 (H), SS 7187 (H), SS 7197 (H), Sugared (H), Sugar Heart (H), Sweet Gem (H), Sweet Polly (H), Talca (H), Traveler (H), Troubadour (H), Warrior (nun 1009) (H)
Non-harvestable Pollenizer	Ace Plus, Co-Pilot, Minipol, Polimax, Premium, SP-6, SP-7, Wildcard Plus, Wingman
Triploid (seedless, mini)	Ana (H), Belmont (H), Excite (H), Extazy (H), Leopard (H), Ocelot (H), Promesa (H), Sirius (H)

H=hybrid

Asian Cucurbits

This group includes cucurbit fruits that can be eaten immature like several other vegetables with edible tender stems and leaves. Matured luffa are not edible, but after peeling off their skin and drying them, they can be used as durable scrubs for dishwashing or showering. All these Asian cucurbits can be grown on raised beds, with or without plastic mulch, and with drip, overhead, or subsurface irrigation. Most of them are well trellised to support the long vines and fruits, primarily to maximize space and sufficient sunlight, to minimize bud drop and fruit rot caused by overshading and exposure to soil moisture and pathogens, and to promote straight fruit. Winter melon is the exception because it is generally too heavy to trellis. Fertilizer recommendations for cucumbers are applicable for fuzzy melon, long gourd, both luffas, Chinese cucumber, bittermelon, and snake gourd. There are two types of bittermelon: Indian and Chinese. The Indian type has smaller fruit with dark-green color and soft, prickled skin, and the Chinese type has longer, larger fruit with light-green color and smooth skin. The Indian type tastes more bitter than the Chinese type. Chinese cucumber, though rarely commercially available, has fruit more than 1 foot long with dark-green color, very thin and rough skin, and crisp texture, similar to European cucumber, but crunchier. Recommendations for watermelon should be followed for winter melon and chayote. With the exception of chayote, where the entire fruit is planted, these crops are started from seed and grown as transplants prior to being set in the field.

Table 8. Planting dates for Asian cucurbits.

Planting Region	Dates							
	Bittermelon	Long Gourd	Angled Luffa	Smooth Luffa	Fuzzy Melon	Snake Gourd	Chayote	Winter Melon
North Florida	Feb–Apr; July–Aug	Feb–Apr; July–Aug	Feb–Apr; July–Aug	Feb–Apr; July–Aug	Feb–Apr; July–Aug	Feb–Apr; July–Aug	NR	Feb–Apr
Central Florida	Jan–Mar; Sept	Jan–Mar; Sept	Jan–Mar; Sept	Jan–Mar; Sept	Jan–Mar; Sept	Jan–Mar; Sept	NR	Jan–Mar
South Florida	Sept–Feb	Sept–Feb	Sept–Feb	Sept–Feb	Sept–Feb	Sept–Feb	Sept–Feb	Dec 15–Mar 1
NR = Not Recommended								

Table 9. Planting information for Asian cucurbits.

Planting Parameters	Measurements							
	Bittermelon	Long Gourd	Angled Luffa	Smooth Luffa	Fuzzy Melon	Snake Gourd	Chayote	Winter Melon
Distance between rows (in)	60–72	60–72	60–72	60–72	60–72	60–72	60–72	72–108
Distance between plants (in)	36–60	36–60	36–60	36–60	36–60	36–60	36–60	36–72
Days to maturity from seed	80–100	–	–	–	–	–	–	–
Plant populations (acre)	2904	2904	2904	2904	2904	2904	2904	1452–2420
Seeding depth (in)	–	–	–	–	1.5–2.0	1.5–2.0	Whole fruit is used: cover halfway	1.5–2.0
Seed per acre	–	–	–	–	–	–	2904—whole fruit	–

Table 10. Cultivars for Asian cucurbits.

Asian cucurbits	Cultivars
Bittermelon (Chinese)*	Hong Kong Green, Hybrid Bangkok Large, Japan Green Sprindle, Taiwan Large
Bittermelon (Indian)*	Hybrid India Star, India Green Long, India Green Queen, Palee
Winter Melon	Giant Wax, Hybrid Red Doll, Hybrid Small Round, Hybrid Wonder Wax, Round Tong Gwa
Snake Gourd*	Buag Ngu, Extra Long Dancer, Hybrid Snaky, Long EX, Polo
Angled Luffa*	Bonanza, Buam Liam Hybrid, Hybrid Green Glory, Lucky Boy, Summer Long
Smooth Luffa*	Dok Hybrid, Hybrid Smooth Beauty, Smooth Boy
Long Gourd*	Bitter Gourd Long, Hybrid Asia Short, Hybrid India Long
Fuzzy Melon*	Chiang Shin Joker, Mokwa, Mokwa Long, Seven Star Long
Chayote*	The seed is the viviparous fruit itself. There is some debate as to whether varieties remain true. Fruit purchased from grocery stores may not sprout.
*Should be trellised	

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 Extension agents. A list of local UF/IFAS Extension offices is available at https://sfyl.ifas.ufl.edu/find-your-local-office/.

Table 11. Herbicides approved for managing weeds in cucurbit crops. **Labels change frequently. Be sure to read a current product label before applying any chemical.** Contact: Nathan Boyd, UF/IFAS Gulf Coast Research and Education Center.

	Active Ingredient lb a.i./Acre	Trade Name Product/Acre	MOA Code	Crops	Weeds Controlled/Remarks
PREEMERGENCE	**Bensulide** 5.0–6.0	(Prefar) 4 E 5–6 qt	8	All cucurbits	Annual broadleaf and grass control. Incorporate or irrigate 1–2 inches within 36 hr of application. Non-labeled crops should not be planted within 120 days of application.
	Carfentrazone up to 0.031	(Aim) 2.0 EC up to 2 fl oz	14	All cucurbits	Apply as a preplant burndown for emerged broadleaf weeds. Use crop oil concentrate, methylated seed oil, or nonionic surfactant at recommended rates. No more than 0.096 lb a.i./A per season. No pretransplant interval.
	Clomazone 0.15–0.38	(Command) 3 ME 0.4–1 pt	13	Cucumber	Annual broadleaf and grass weeds. Use lower rates on coarse soils. Read label for additional restrictions. PHI 30 days.
	Clomazone 0.15–0.25	(Command) 3 ME 0.4–0.67 pt	13	Muskmelon, watermelon	Annual broadleaf and grass weeds. Use lower rates on coarse soils. Read label for additional restrictions.
	Clomazone 0.25–0.50	(Command) 3 ME 0.67–1.33 pt	13	Summer squash	Annual broadleaf and grass weeds. Broadcast for bare-ground production; row middles only if growing on plastic. PHI 30 days.
	Clomazone 0.25–0.75	(Command) 3 ME 0.67–2 pt	13	Winter squash	Annual broadleaf and grass weeds. Broadcast for bare-ground production; row middles only if growing on plastic. Read labels for cultivar restrictions. PHI 45 days.
	Ethalfluralin + Clomazone 0.4–0.6 + 0.13–0.19	(Strategy) 2–3 pt	3 + 13	Cucumbers, melons, summer and winter squash, pumpkin, watermelon	Annual broadleaf and grass control. Must be applied no later than 2 days after seeding. Overhead irrigation or rainfall of 0.5 in within 5 days. Do not apply under plastic mulch or over top of plants.
	Flumioxazin up to 0.125	(Chateau) EZ up to 4 fl oz	14	Cucumber, muskmelon, watermelon, pumpkins, summer and winter squash	Broadleaf and grass control. Row middles only. Do not apply after crops are transplanted/seeded. Label is a Third-Party Registration (TPR, Inc.). Use without a signed authorization and waiver of liability is a misuse of the product.
	Glufosinate up to 0.79	(Rely) 280 43 oz	10	Muskmelon, watermelon, cucumber, pumpkin, summer and winter squash, and others on label	Burndown of emerged broadleaves, grasses, and nutsedge. May be applied as a preplant burndown and preplant to plastic mulch covered beds. See label for planting intervals. 30-day PHI for melons. 14-day PHI for cucumbers, gourds, pumpkins, and squash.
	Glyphosate	(various formulations) consult labels	9	All cucurbits	Controls emerged broadleaf, grass weeds, and nutsedge. Consult individual labels for restrictions.

	Active Ingredient lb a.i./Acre	Trade Name Product/Acre	MOA Code	Crops	Weeds Controlled/Remarks
	Halosulfuron 0.024	(Sandea) 75 DG 0.5 oz	2	Cantaloupe, cucumber, crenshaw, honeydew	Yellow and purple nutsedge and broadleaf control. Apply after seeding but before soil cracking on bare ground or prior to laying the plastic mulch. Apply uniformly with ground equipment in a minimum of 15 gal of water per acre.
	Halosulfuron 0.024–0.036	(Sandea) 75 DG 0.5–0.75 oz	2	Watermelon	Yellow and purple nutsedge and broadleaf control. May be applied preemergence to seeded watermelon on bareground or preseeding to mulch-cultured watermelon. Transplanting should be no sooner than 7 days after application. Use lighter rates on sandy soils with low organic matter.
	Halosulfuron 0.024–0.036	(Sandea) 75 DG 0.5–0.75 oz	2	Pumpkin, winter squash	Yellow and purple nutsedge and broadleaf control. Apply before soil cracking or pretransplant. Transplanting should not be made sooner than 7 days after application. May be applied POST over the top when plants reach the 4–5 true-leaf stage, but before first female flowers appear.
	Paraquat 0.63–0.94	(Gramoxone) 2 SL 2–4 pt (Firestorm) 3 SL 1.3–2.7 pt	22	Cucumber, muskmelon, cantaloupe, pumpkin, squash, watermelon	Controls emerged weeds. Apply prior, during, or after planting, but before crop emergence. Use a nonionic surfactant. Consult label for new restrictions.
	Pelargonic acid	(Scythe) 4.2 EC 3%–10% v/v	27	All cucurbits	Controls emerged weeds. Apply before emergence of crop. Product is a contact, nonselective, foliar-applied herbicide. There is no residual activity. May be tank-mixed with soil residual herbicides.
	Pendimethalin 1.0	(Prowl H20) 2.1 pt	3	Cantaloupe, citron melon, muskmelon, watermelon	Annual broadleaf and grass weeds. Apply to the row middles only. May be applied as a sequential application with 2.1 pt/A before and 2.1 pt/A after transplanting or seeding, with 21 days between applications. No more than 4.2 pt/A per season.
	S-metolachlor 0.95–1.26	(Brawl, Dual Magnum) 1.0–1.33 pt	15	Pumpkin	Annual broadleaf and grass weeds and nutsedge control. Apply as inter-row or inter-hill application. Leave a 1-ft untreated area over the seeded row (6 inches on either side of the row). Use lower rates on lighter soils. Apply before weeds emerge.

	Active Ingredient lb a.i./Acre	Trade Name Product/Acre	MOA Code	Crops	Weeds Controlled/Remarks
POSTTRANSPLANT / POSTEMERGENCE	**Carfentrazone** up to 0.031	(Aim) 2.0 EC up to 2 fl oz	14	All cucurbits	Emerged broadleaf control. Post-direct hooded application to row middles for burndown of emerged broadleaf weeds. Use crop oil concentrate or nonionic surfactant at recommended rates. PHI 0 days.
	Clethodim 0.09–0.13 0.07–0.12	(Arrow) 2 EC 6–8 oz (Select Max) 1 EC 9–16 fl oz	1	Cucumber, squash, melons, and all commodities in crop group	Annual and perennial grass control. Use a crop oil concentrate at 1% v/v spray volume. Use nonionic surfactant in Select Max. PHI 14 days.
	Ethalfluralin + Clomazone	(Strategy) 2–3 pt	3 + 13	Cucumber, melon, summer & winter squash, pumpkin, watermelon	Annual broadleaf and grass control. After transplanting apply to row middles only. Does not control emerged weeds. PHI 45 days.
	Glufosinate up to 1.24	(Rely) 280 64 fl oz	10	Muskmelon, watermelon, cucumber, pumpkin, summer squash, winter squash, and others on label	Burndown of emerged broadleaves, grasses, and nutsedge. May be applied with a shielded applicator between rows of established cucurbits. 30-day PHI for melons. 14-day PHI for cucumbers, gourds, pumpkins, and squash.
	Glyphosate	(various formulations) consult labels	9	All cucurbits	Control emerged broadleaf and grass weeds. Apply to row middles only. Use a hooded sprayer to reduce drift. Read individual labels for restrictions.
	Halosulfuron 0.04–0.05	(Sandea) 75 DF 0.5–1 oz	2	Cucumber, cantaloupe, honeydew, crenshaw melon	Apply after the 3–5 true leaf stage (no sooner than 14 days after transplanting) but before the first female flower. Spot spray a POST application if a PRE application was made. Cucumber PHI 30 days. Cantaloupe, honeydew, crenshaw 57 days.
	Halosulfuron 0.02–0.05 0.02–0.04	(Sandea) 75 DF 0.5–1.0 oz 0.5–0.75 oz	2	Watermelon, summer squash Pumpkin, winter squash	Nutsedge and broadleaf weeds. Apply to the row middles only. Include a NIS in the spray solution. PHI 57 days in watermelon. PHI 30 days for summer/winter squash and pumpkin.
	Imazosufuron 0.19–0.3	(League) 75 WG 4–6.4 oz	2	Muskmelon, watermelon	Nutsedge and broadleaf weeds. No more than 6.4 oz/A per year. No more than 1 application per year. Surfactant is needed if weeds have emerged. Row middles only. PHI 45 days.
	Paraquat 0.47–0.93	(Gramoxone) 2 SL 1.88–3.72	22	Cucumber, muskmelon, cantaloupe, pumpkin, squash, watermelon	Controls emerged weeds. Row middles only. No more than 3 applications per year. Gramoxone SL is a supplemental label. Consult labels for other paraquat formulations. Consult label for new restrictions.

	Active Ingredient lb a.i./Acre	Trade Name Product/Acre	MOA Code	Crops	Weeds Controlled/Remarks
	Pelargonic acid	(Scythe) 4.2 EC 3%–10% v/v	27	Cucumber, gourd, muskmelon, cantaloupe, pumpkin, squash, watermelon	Controls emerged weeds. Row middles only. Use a shielded sprayer directed to the row middles to reduce drift to the crop.
	Pendimethalin 1.0	(Prowl H20) 2.1 pt	3	Cantaloupe, citron melon, muskmelon, watermelon	Annual broadleaf and grass weeds. Apply to the row middles only. Apply 2.1 pt/A after transplanting or seeding and before vines are off the bed and in the spray area. If a preplant application was applied, no more than 4.2 pt/A per season. PHI 35 days.
	Sethoxydim 0.19–0.28	(Poast) 1.5 EC 1.0–1.5 pt	1	All cucurbits	Growing grass weeds. Include a crop oil concentrate. Efficacy is decreased if weeds are under stress. Use 1 pt for seedling grasses and 1.5 pt on perennial grasses. PHI 14 days.
	S-metolachlor 0.95–1.26	(Brawl, Dual Magnum) 7.62 EC 1.0–1.33 pt	15	Pumpkin	Annual broadleaf and grass weeds and nutsedge. Apply as inter-row or inter-hill application. Leave a 1-foot untreated area over the plant (6 in on either side of the row). Use lower rates on lighter soils. Apply before weeds emerge. PHI 30 days.
	Terbacil 0.1–0.2	(Sinbar) 80 WP 2–4 oz	5	Watermelon	Annual broadleaf weeds. Apply to row middles only. Do not allow contact with plant foliage. No more than 4 oz per year. PHI 70 days.
	Trifluralin	(Treflan) 4 EC 1.0 pt (Treflan) TR 10 5 lb	3	All cucurbits	Annual broadleaf and grass control. Apply after crop is 3–4 true leaf stage. Row middles only. PHI 30 days except for watermelon 60 days.
POSTHARVEST	**Diquat** 0.25	(Reglone Dessicant) 1.0 pt	22	Cantaloupe	No more than 35 gal/A. Include an NIS. Thorough coverage is required.
	Diquat 0.38	(Reglone Dessicant) 1.5 pt	22	Cucumber, watermelon, squash (except acorn)	No more than 35 gal/A. Include an NIS. Thorough coverage is required.
	Diquat 0.5	(Reglone Dessicant) 2.0 pt	22	Squash (acorn)	No more than 35 gal/A. Include an NIS. Thorough coverage is required.

Table 12. Insecticides labeled for management of arthropod pests of cucurbit crops. **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: Xavier Martini, UF/IFAS North Florida Research and Education Center—Quincy, or 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	1A	***Lannate LV** (methomyl)	1.5–3 pt	18 pt	48	3	No more than 12 applications per year.
	1A	***Lannate SP** (methomyl)	0.5–1 pt	6 pt	48	3	No more than 12 applications per year.
	1A	***Vydate L** (oxamyl)	2–4 pt	16 pt	48	1	Reapplications at least 7 days apart.
	1B	**Dimethoate 4 EC** (dimethoate)	Melons: 1 pt Watermelons: 0.5–1 pt	2 pt per year	48	3	Highly toxic to bees. Not for squash or cucumber.
	1B	**Malathion 5EC Malathion 8** (malathion)	**5EC:** Cucumber: 1.5–2.8 pt Summer squash: 2.0–2.8 pt Winter squash: 1.6 pt Watermelon: 1.5–2.5 pt Melon: 1.6 pt **8:** Summer squash, winter squash, cucumber: 1.75 pt	**5EC:** Cucumber: 5.6 pt Summer squash: 8.4 pt Winter squash: 4.8 pt Watermelon: 5 pt **8:** Cucumber: 3.5 pt Summer squash, winter squash: 5.25 pt	24	1	**5EC:** No more than 2 applications per year. **8:** Squash and cucumbers only.
	3A	***Athena** (bifenthrin)	7–17 fl oz	51 fl oz	12	7	No more than 2 consecutive applications. No more than 2 applications after bloom.
	3A	***Brigade 2 EC** (bifenthrin)	2.6–6.4 fl oz	19.2 fl oz	12	3	No more than 2 applications after bloom. Highly toxic to foraging bees.
	3A	***Danitol 2.4 EC** (fenpropathrin)	10.67–16 fl oz	42.67 fl oz	24	7	Highly toxic to foraging bees. Can be tank-mixed with 3–4 oz of Belay insecticide.
	3A	***Hero** (bifenthrin & zeta-cypermethrin)	4–10.3 oz	41.2 oz	12	3	No more than 4 applications per season. Reapplications at least 10 days apart.
	3A	**Pyganic Crop Protection EC 5.0** (pyrethrins)	4.5–15.61 oz	15.61 oz	12	0	OMRI-listed[2]. No more than 10 applications per season.
	3A + 4A	***Endigo ZC** (lambda-cyhalothrin + thiamethoxam)	4.5 fl oz	19 fl oz	24	1	Apply before pests reach damaging levels.
	3A + 6	***Gladiator** (zeta-cypermethrin + avermectin B1)	19 fl oz	57 fl oz	12	7	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	**Actara** (thiamethoxam)	1.5–3.0 oz	11.0 oz	12	0	Apply before pests reach damaging levels. Highly toxic to foraging bees.
	4A	**Admire Pro** (imidacloprid) (see appropriate labels for other brands)	7–10.5 oz **Planthouse:** 0.44 fl oz/10,000 plants	10.5 fl oz	12	**Soil:** 21	**Planthouse:** 1 application to transplants. See label for use on mature greenhouse cucumbers.
	4A	**Assail 30 SG** (acetamiprid)	2.5–4 oz	20.0 oz	12	0	No more than 5 applications per season. Do not use with other group 4A insecticides. Toxic to foraging bees.
	4A	**Belay Insecticide** (clothianidin)	Foliar: 3.0–4.0 fl oz Soil: 9.0–12.0 fl oz	12 fl oz	12	Foliar: Do not make application after 4th true leaf on main stem is unfolded. Soil: 21	Do not apply when plants are blooming.
	4A	**Platinum 75SG** (thiamethoxam)	5–11 fl oz **75SG:** 1.66–3.67 oz	11 fl oz **75SG:** 3.67 oz	12	30	A 120-day plant-back interval must be observed. Highly toxic to foraging bees.
	4A	**Safari 20 SG** (dinotefuran)	3.5–7.0 oz	1.34 lb	12	–	For transplants in greenhouse only.
	4A + 28	**Durivo** (thiamethoxam + chlorantraniliprole)	10–13 fl oz	13 fl oz	12	30	–
	4A + 28	**Voliam Flexi** (thiamethoxam + chlorantraniliprole)	4–7 oz	14 oz	12	1	–
	4C	**Closer SC** (sulfoxaflor)	1.5–2.0 fl oz	17 fl oz	12	1	Highly toxic against pollinators: Notify known beekeepers within 1 mile of the treatment area. Limit application to times when managed bees and native pollinators are least active.
	4D	**Sivanto Prime** (flupyradifurone)	Foliar: 7–14 fl oz Soil: 21–28 fl oz	Foliar: 28 fl oz Soil: 28 fl oz per crop season	4	Foliar: 1 Soil: 21	Foliar: Reapplications at least 7 days apart. Soil: No more than 3 crop seasons per year.
	6 + 28	***Minecto Pro** (abamectin + cyantraniliprole)	10 fl oz	20 fl oz	24	7	Highly toxic to pollinators. Do not spray during bloom.
	9B	**Fulfill** (pymetrozine)	2.75 oz	5.5 oz	12	0	Reapplications at least 7 days apart.
	9B	**PQZ** (pyrifluquinazon)	2.4–3.2 fl oz	9.6 fl oz	12	7	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]
	9D	**Sefina Inscalis Insecticide** (afidopyropen)	3.0 fl oz	28 fl oz	12	0	Reapplications at least 7 days apart. No more than 2 consecutive applications. Maintain a 10-ft vegetative filter strip of permanent vegetation between the field edge and aquatic habitat.
	28	**Exirel** (cyantraniliprole)	13.5–20.5 fl oz	61.6 fl oz	12	1	No more than 0.4 lb a.i./A of cyazypyr- or cyantraniliprole-containing products per season, either as foliar or soil applications.
	28	**Verimark** (cyantraniliprole)	At planting: 10–13.5 fl oz Drip chemigation: 10 fl oz	At planting: 13.5 fl oz Drip chemigation: 20 fl oz (or 10 fl oz if at-plant also used)	4	1	Both at-plant and drip chemigation. No more than 2 drip chemigation applications (one if at-plant application used).
	29	**Beleaf 50 SG** (flonicamid)	2.0–2.8 oz	8.4 oz	12	0	Begin applications before pests reach damaging levels.
Beetles (including cucumber beetle and flea beetle)	1A	**Lannate LV** (methomyl)	1.5–3 pt	18 pt	48	3	No more than 12 applications per year.
	1A	**Lannate SP** (methomyl)	0.5–1 pt	12 pt	48	3	No more than 12 applications per year.
	1A	**Sevin 4F, XLR** (carbaryl)	0.5–1.0 qt	6 qt	12	3	Do not apply when plants are wet. Has been reported to flare mites. Do not apply to plants in bloom.
	1B	**Malathion 5EC Malathion 8** (malathion)	**5EC:** Cucumber: 1.5–2.8 pt Summer squash: 2.0–2.8 pt Winter squash: 1.6 pt Watermelon: 1.5–2.5 pt Melon: 1.6 pt **8:** Summer squash, winter squash, cucumber: 1.75 pt	**5EC:** Cucumber: 5.6 pt Summer squash: 8.4 pt Winter squash: 4.8 pt Watermelon: 5 pt **8:** Cucumber: 3.5 pt Summer squash: 5.25 pt Winter squash: 5.25 pt	24	1	**5EC:** No more than 2 applications per year. **8:** Squash and cucumbers only.
	3A	***Baythroid XL** (beta-cyfluthrin)	2.4–2.8 fl oz	11.2 fl oz	12	0	Can be used on all cucurbits in crop group 9. Highly toxic to foraging bees.
	3A	***Brigade 2 EC** (bifenthrin)	2.6–6.4 fl oz	19.2 fl oz	12	3	No more than 2 applications after bloom. Highly toxic to foraging 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	***Capture LFR** (bifenthrin)	6.8–8.5 fl oz, at planting	8.5 fl oz	12	N/A—applied at planting	At planting, banded over open furrow or in-furrow with seed or transplant.
	3A	***Danitol 2.4 EC** (fenpropathrin)	10.67–16 fl oz	42.67 fl oz	24	7	Highly toxic to foraging bees.
	3A	***Pounce 25 WP** (permethrin)	6.4–12.8 oz	76.8 oz Cantaloupe: 51.2 oz	12	0	Use high rate for aphids and squash bug. Highly toxic to foraging bees.
	3A	**Pyganic Crop Protection EC 5.0** (pyrethrins)	4.5–15.61 oz	15.61 oz	12	0	OMRI-listed[2]. No more than 10 applications per season.
	3A	***Warrior II** (lambda-cyhalothrin)	1.28–1.92 fl oz	11.5 fl oz	24	1	Do not apply to blooming crops.
	3A + 4A	***Endigo ZC** (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	19 oz	24	1	–
	3A + 6	***Gladiator** (avermectin B1 + zeta-cypermethrin)	19 fl oz	57 fl oz	12	7	–
	3A + 28	***Besiege** (lambda-cyhalothrin + chlorantraniliprole)	6–9 fl oz	31 fl oz	24	1	–
	4A	**Actara** (thiamethoxam)	1.5–3.0 oz	11.0 oz	12	0	Apply before pests reach damaging levels. Highly toxic to foraging bees.
	4A	**Admire Pro** (imidacloprid) (see appropriate labels for other brands)	7–10.5 oz	10.5 fl oz	12	21	Not for planthouse.
	4A	**Assail 30 SG** (acetamiprid)	2.5–5.3 oz	26.5 oz	12	0	No more than 5 applications per season. Toxic to foraging bees.
	4A	**Belay Insecticide** (clothianidin)	Foliar: 3.0–4.0 fl oz Soil: 9.0–12.0 fl oz	12 fl oz	12	Foliar: Do not make application after 4th true leaf on main stem is unfolded. Soil: 21	Do not apply when plants are blooming.
	4A	**Scorpion 35SL Insecticide** (dinotefuran)	Foliar: 2–7 fl oz Soil: 9–10.5 fl oz	Foliar: 10.5 fl oz Soil: 21 fl oz	12	Foliar: 1 Soil: 21	Highly toxic to foraging bees for 38 hr after application.
	4A	**Venom Insecticide** (dinotefuran)	Foliar: 1–4 oz	6 oz	12	Foliar: 1	Highly toxic to foraging bees. Use only foliar application for beetles. Pests controlled differ depending on 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 fl oz	12	30	–
	4A + 28	**Voliam Flexi** (thiamethoxam + chlorantraniliprole)	4–7 oz	14 oz	12	1	–
	15	**Rimon 0.83EC** (novaluron)	9–12 fl oz	36 fl oz	12	1	Spray reapplications at least 14 days apart.
	28	**Exirel** (cyantraniliprole)	13.5–20.5 fl oz	61.6 fl oz	12	1	No more than 0.4 lb a.i./A per season either as foliar or soil applications.
	U	**Grandevo** (*Chromobacterium subtsugae*)	2–3 lb	–	4	0	–
	U	**Venerate** (*Burkholderia rinojensis*)	2–4 lb	–	4	0	–
Caterpillars (incl. armyworms, cabbage looper, corn earworm, cutworm, melonworm, pickleworm)	1A	**Lannate LV** (methomyl)	1.5–3 pt	18 pt	48	3	No more than 12 applications per year.
	1A	**Lannate SP** (methomyl)	0.5–1 pt	12 pt	48	3	No more than 12 applications per year.
	1A	**Sevin 4F, XLR** (carbaryl)	0.5–1.0 qt	6 qt	12	3	Do not apply when plants are wet. Has been reported to flare mites. Do not apply to plants in bloom. Pickleworm and melonworm only.
	1B	**Malathion 5EC Malathion 8** (malathion)	**5EC:** Cucumber: 1.5–2.8 pt Summer squash: 2.0–2.8 pt Winter squash: 1.6 pt Watermelon: 1.5–2.5 pt Melon: 1.6 pt **8:** Summer squash, winter squash, cucumber: 1.75 pt	**5EC:** Cucumber: 5.6 pt Summer squash: 8.4 pt Winter squash: 4.8 pt Watermelon: 5 pt **8:** Cucumber: 3.5 pt Summer squash, winter squash: 5.25 pt	24	1	**5EC:** No more than 2 applications per year **8:** Squash and cucumbers only.
	3A	***Ambush 25W** (permethrin)	6.4–12.8 oz	1.2 lb Cantaloupe: 0.8 lb	12	0	No more than 8 applications per season. Highly toxic to bees.
	3A	***Asana XL (0.66 EC)** (esfenvalerate)	5.8–9.6 fl oz	48 fl oz	12	3	No more than 5 applications per season. Cucumber, melons, pumpkin, summer and winter squash only. Highly toxic to foraging 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	***Athena** (bifenthrin)	7–17 fl oz	51 fl oz	12	7	No more than 2 consecutive applications. No more than 2 applications after bloom.
	3A	***Baythroid XL** (beta-cyfluthrin)	0.8–2.8 fl oz	11.2 fl oz	12	0	Can be used on all cucurbits in crop group 9. Highly toxic to foraging bees.
	3A	***Brigade 2 EC** (bifenthrin)	2.6–6.4 fl oz	19.2 fl oz	12	3	No more than 2 applications after bloom. Highly toxic to foraging bees.
	3A	***Capture LFR** (bifenthrin)	3.4–6.8 fl oz, at planting	8.5 fl oz	12	N/A—applied at planting	At planting, banded over open furrow or in-furrow with seed or transplant.
	3A	***Danitol 2.4 EC** (fenpropathrin)	10.67–16 fl oz	42.67 fl oz	24	7	Highly toxic to foraging bees.
	3A	***Hero** (bifenthrin + zeta-cypermethrin)	4 -10.3 oz	41.2 oz	12	3	No more than 4 applications per season. Reapplications at least 10 days apart.
	3A	***Mustang** (zeta-cypermethrin)	3.0–4.3 oz	25.8 fl oz	7	12	Reapplications at least 7 days apart.
	3A	***Pounce 25 WP** (permethrin)	6.4–12.8 oz	76.8 oz Cantaloupe: 51.2 oz	12	0	Use high rate for aphids and squash bug. Highly toxic to foraging bees.
	3A	**Pyganic Crop Protection EC 5.0** (pyrethrins)	4.5–15.61 oz	15.61 oz	12	0	OMRI-listed[2]. No more than 10 applications per season.
	3A	***Warrior II** (lambda-cyhalothrin)	1.28–1.92 fl oz	11.5 fl oz	24	1	Do not apply to blooming crops.
	3A + 4A	***Endigo ZC** (lambda-cyhalothrin + thiamethoxam)	4–4.5 fl oz	19 fl oz	24	1	–
	3A + 6	***Gladiator** (avermectin B1 + zeta-cypermethrin)	19 fl oz	57 fl oz	12	7	–
	3A + 28	***Besiege** (lambda-cyhalothrin + chlorantraniliprole)	6–9 fl oz	31 fl oz	24	1	No more than 4 applications per year.
	4A	**Assail 30SG** (acetamiprid)	2.5–5.3 oz	26.5 oz	12	0	No more than 5 applications per season. Do not use with other group 4A insecticides. Toxic to foraging bees.
	4A + 28	**Durivo** (thiamethoxam + chlorantraniliprole)	10–13 fl oz	13 fl oz	12	30	–

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	12	1	–
	5	**Radiant SC** (spinetoram)	5–10 fl oz	34 fl oz	4	3 Cucumbers: 1	No more than 6 applications. Toxic to bees for up to 3 hr following application.
	6	***Proclaim** (emamectin benzoate)	3.0–4.8 fl oz	14.4 fl oz	12	7	Apply this product diluted in a minimum volume of 10 gal/A. No more than 2 consecutive applications.
	6 + 28	***Minecto Pro** (abamectin + cyantraniliprole)	5.5–10 fl oz	20 fl oz	24	7	Restrictions exist for this product because of the risk to pollinators.
	11A	**Agree WG** (*Bacillus thuringiensis* subspecies *aizawai*)	0.5–2.0 lb	–	4	0	Apply when larvae are small for best control. OMRI-listed[2].
	11A	**Biobit HP** (*Bacillus thuringiensis* subspecies *kurstaki*)	0.5–2.0 lb	–	4	0	Treat when larvae are young. Good coverage is essential. Can be used in the greenhouse. OMRI-listed[2].
	11A	**Crymax WDG** (*Bacillus thuringiensis* subspecies *kurstaki*)	0.5–2.0 lb	–	4	0	Use high rate for armyworms. Treat when larvae are young. Genetically engineered strain of *Bt*-containing toxins from both *Bt kurstaki* and *Bt aizawai* strains. Not for organic production.
	11A	**Deliver** (*Bacillus thuringiensis* subspecies *kurstaki*)	0.25–1.5 lb	–	4	0	Use higher rates for armyworms. OMRI-listed[2].
	11A	**DiPel DF** (*Bacillus thuringiensis* subspecies *kurstaki*)	0.5–2.0 lb	–	4	0	Treat when larvae are young. Good coverage is essential. OMRI-listed[2].
	11A	**Javelin WG** (*Bacillus thuringiensis* subspecies *kurstaki*)	0.12–1.50 lb	–	4	0	Treat when larvae are young. Thorough coverage is essential. Use higher rates for armyworms. OMRI-listed[2].
	11A	**Xentari DF** (*Bacillus thuringiensis* subspecies *aizawai*)	0.5–2.0 lb	–	4	0	Treat when larvae are young. Thorough coverage is essential. May be used in the greenhouse. OMRI-listed[2].
	15	**Rimon 0.83EC** (novaluron)	12 fl oz	36 fl oz	12	1	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]
	18	**Intrepid 2F** (methoxyfenozide)	4–10 fl oz	64 fl oz	4	3	No more than 4 applications per season.
	22	**Avaunt** (indoxacarb)	2.5–6.0 oz	24 oz	12	3	Highly toxic to foraging bees. Do not apply this product or allow it to drift to blooming crops or weeds while bees are foraging in the treatment area. Spray reapplications at least 5 days apart.
	28	**Coragen** (chlorantraniliprole)	Drip: 2.0–7.5 fl oz Soil at planting: 3.5–7.5 fl oz Foliar: 2.0–7.0 fl oz	15.4 fl oz Combined at-plant and drip chemigation soil application: 10 fl oz	4	1	May be applied through drip (chemigation), as well as to soil at planting, or as a foliar spray.
	28	**Exirel** (cyantraniliprole)	7.0–13.5 fl oz	61.6 fl oz	12	1	No more than 0.4 lb a.i./A per crop, either as foliar or soil applications.
	28	**Verimark** (cyantraniliprole)	At planting: 6.75–13.5 fl oz Drip chemigation: 5–10 fl oz	At planting: 13.5 fl oz Drip chemigation: 20 fl oz (or 10 fl oz if at-plant also used)	4	1	Both at-plant and drip chemigation. No more than 2 drip chemigation applications (1 if an at-plant application is used).
Fire ants	6	**Clinch** (Abamectin)	1 lb in broadcast application or 5 tbsp per mount	4 lb	–	0	Do not apply if rainfall may occur in the next 6 hrs. Ants need to be actively foraging.
	7A	**Extinguish** (S-methoprene)	0.75 lb	–	4	0	Slow-acting IGR (insect growth regulator). Best applied early spring and fall where crop will be grown. May be applied by ground equipment or aerially.
	7C	**Esteem Ant Bait** (pyriproxyfen)	1.5–2.0 lb	2.0 lb	12	1	Apply when ants are actively foraging.
Leafminers	1A	**Vydate L** (oxamyl)	2–4 pt	12 pt	48	1	Reapplications at least 7 days apart.
	1B	**Dimethoate 4 EC** (dimethoate)	Melons: 1 pt Watermelons: 0.5–1 pt	2 pt per year	48	3	Highly toxic to bees. Not for squash or cucumber.
	3A	***Ambush 25W** (permethrin)	6.4–12.8 oz	1.2 lb Cantaloupe: 0.8 lb	12	0	No more than 8 applications per season. Highly toxic to bees.
	3A	***Athena** (bifenthrin)	13.5–17 fl oz	51 fl oz	12	7	No more than 2 consecutive applications. No more than 2 applications after bloom.
	3A	***Danitol 2.4 EC** (fenpropathrin)	10.67–16 fl oz	42.67 fl oz	24	7	Highly toxic to foraging 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 + 6	***Gladiator** (avermectin B1 + zeta-cypermethrin)	19 fl oz	57 fl oz	12	7	–
	3A + 28	***Besiege** (lambda-cyhalothrin + chlorantraniliprole)	6–9 fl oz	31 fl oz	24	1	No more than 4 applications per year.
	4A	**Belay Insecticide** (clothianidin)	Foliar: 3.0–4.0 fl oz Soil: 9.0–12.0 fl oz	12 fl oz	12	Foliar: Do not make application after 4th true leaf on main stem is unfolded. Soil: 21	Do not apply when plants are blooming.
	4A	**Safari 20 SG** (dinotefuran)	3.5–5.0 fl oz	1.34 lb	–	–	For transplants in greenhouse only.
	4A	**Scorpion 35SL Insecticide** (dinotefuran)	Foliar: 2–7 fl oz Soil: 9–10.5 fl oz	Foliar: 10.5 fl oz Soil: 21 fl oz	12	Foliar: 1 Soil: 21	Use only 1 application method (soil or foliar). Do not use with other Group 4A insecticides. Highly toxic to foraging bees for 38 hr after application.
	4A	**Venom Insecticide** (dinotefuran)	Foliar: 1–4 oz Soil: 5–7.5 oz	Foliar: 6 oz Soil: 12 oz	12	Foliar: 1 Soil: 21	Highly toxic to foraging bees. Use only 1 application method (soil or foliar). Pests controlled differ depending on application method.
	5	**Radiant SC** (spinetoram)	5–10 fl oz	34 fl oz	4	3 Cucumbers: 1	No more than 6 applications. Toxic to bees for up to 3 hrs following application.
	6	***Agri-Mek SC** (abamectin)	1.75–3.50 fl oz	10.25 fl oz	12	7	No more than 2 sequential applications. Must be mixed with an adjuvant. Highly toxic to foraging bees.
	6 + 28	***Minecto Pro** (abamectin + cyantraniliprole)	5.5–10 fl oz	20 fl oz	24	7	Restrictions exist for this product due to the risk for pollinators. Apply as soon as leafminers are observed on the leaves.
	15	**Rimon 0.83EC** (novaluron)	9–12 fl oz	36 fl oz	12	1	Reapplications at least 14 days apart.
	17	**Trigard** (cyromazine)	2.66 oz	15.96 oz	12	0	No more than 6 applications.
	28	**Coragen** (chlorantraniliprole)	Drip: 2.0–7.5 fl oz Soil at planting: 3.5–7.5 fl oz Foliar: 2.0–7.0 fl oz	15.4 fl oz Combined at-plant and drip chemigation soil application: 10 fl oz	4	1	May be applied through drip (chemigation), as well as to soil at planting, or as a foliar spray.

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	**Exirel** (cyantraniliprole)	13.5–20.5 fl oz	61.6 fl oz	12	1	No more than 0.4 lb a.i./A per crop, either as foliar or soil applications.
	28	**Verimark** (cyantraniliprole)	At planting: 6.75–13.5 fl oz Drip chemigation: 5–10 fl oz	At planting: 13.5 fl oz Drip chemigation: 20 fl oz (or 10 fl oz if at-plant also used)	4	1	Both at plant and drip chemigation. No more than 2 drip chemigation applications (1 if an at-plant application is used).
Mites	1B	**Malathion 5EC Malathion 8** (malathion)	**5EC:** Cucumber: 1.5–2.8 pt Summer squash: 2.0–2.8 pt Winter squash: 1.6 pt Watermelon: 1.5–2.5 pt Melon: 1.6 pt **8:** Summer squash, winter squash, cucumber: 1.75 pt	**5EC:** Cucumber: 5.6 pt Summer squash: 8.4 pt Winter squash: 4.8 pt Watermelon: 5 pt **8:** Cucumber: 3.5 pt Summer squash, winter squash: 5.25 pt	24	1	**5EC:** No more than 2 applications per year. **8:** Squash and cucumbers only.
	3A	***Athena** (bifenthrin)	13.5–17 fl oz	51 fl oz	12	7	No more than 2 consecutive applications. No more than 2 applications after bloom.
	3A	***Danitol 2.4 EC** (fenpropathrin)	10.67–16 fl oz	42.67 fl oz	24	7	Highly toxic to foraging bees.
	3A	***Hero** (bifenthrin & zeta-cypermethrin)	10.3 oz	41.2 oz	12	3	No more than 4 applications per season. Reapplications at least 10 days apart.
	3A	**Pyganic Crop Protection EC 5.0** (pyrethrins)	4.5–15.61 oz	15.61 oz	12	0	No more than 10 applications per season. OMRI-listed[2].
	6	***Agri-Mek SC** (abamectin)	1.75–3.50 fl oz	10.25 fl oz	12	7	No more than 2 sequential applications. Must be mixed with an adjuvant Highly toxic to foraging bees.
	6 + 28	***Minecto Pro** (abamectin + cyantraniliprole)	5.5–10 fl oz	20 fl oz	24	7	Restrictions exist for this product because of the risk to pollinators. Apply as soon as mites are observed.
	10B	**Zeal** (etoxazole)	2.0–3.0 oz	3.0 oz Cucumbers: 6 oz	12	7	Apply when populations are low. No more than 1 application per season, except 2 for cucumbers (supplemental 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]
	20B	**Kanemite 15 SC** (acequinocyl)	31 fl oz	62 fl oz	12	1	No more than 2 applications per season. Do not apply by air. Melons, watermelon, and cucumbers only.
	20D	**Acramite-50WS** (bifenazate)	0.75–1.0 lb	1.0 lb	12	3	No more than 1 application per season.
	21A	**Magister** (fenazaquin)	24–36 fl oz	36 fl oz	12	3	No more than 1 application per year.
	21A	**Portal XLO** (fenpyroximate)	1.0–2.0 pt	4.0 pt	12	3 Cucumbers: 1	All melons, watermelon, and cucumbers**.** No more than 2 applications per season. Effective for broad mite control.
	23	**Oberon 2SC** (spiromesifen)	7.0–8.5 fl oz	25.5 fl oz	12	7	No more than 3 applications.
Squash bug, leaf-footed bug	1A	**Sevin 4F, XLR** (carbaryl)	0.5–1.0 qt	6 qt	12	3	Do not apply when plants are wet. Use of carbaryl has been reported to flare (increase) mites. Do not apply to plants in bloom.
	3A	***Ambush 25W** (permethrin)	6.4–12.8 oz	1.2 lb Cantaloupe: 0.8 lb	12	0	No more than 8 applications at the highest rate per season. Highly toxic to bees.
	3A	***Asana XL (0.66EC)** (esfenvalerate)	5.8–9.6 fl oz	48 fl oz	12	7	–
	3A	***Athena** (bifenthrin)	13.5–17 fl oz	51 fl oz	12	7	No more than 2 consecutive applications. No more than 2 applications after bloom.
	3A	***Brigade 2 EC** (bifenthrin)	2.6–6.4 fl oz	19.2 fl oz	12	3	No more than 2 applications after bloom. Highly toxic to foraging bees.
	3A	***Danitol 2.4 EC** (fenpropathrin)	10.67–16 fl oz	42.67 fl oz	24	7	Highly toxic to foraging bees.
	3A	***Hero** (bifenthrin & zeta-cypermethrin)	4.0–10.3 oz	41.2 oz	12	3	No more than 4 applications per season. Reapplications at least 10 days apart.
	3A	***Pounce 25 WP** (permethrin)	6.4–12.8 oz	76.8 oz Cantaloupe: 51.2 oz	12	0	Use high rate for aphids and squash bug. Highly toxic to foraging bees.
	3A	**Pyganic Crop Protection EC 5.0** (pyrethrins)	4.5–15.61 oz	15.61 oz	12	0	No more than 10 applications per season. OMRI-listed[2].
	3A	***Warrior II** (lambda-cyhalothrin)	1.28–1.92 fl oz	11.5 fl oz	24	1	Do not apply to blooming crops.

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 + 4A	***Endigo ZC** (lambda-cyhalothrin + thiamethoxam)	4.0–4.5 fl oz	19 fl oz	24	1	–
	3A + 6	***Gladiator** (avermectin B1 + zeta-cypermethrin)	19 fl oz	57 fl oz	12	7	–
	3A + 28	***Besiege** (lambda-cyhalothrin + chlorantraniliprole)	6–9 fl oz	31 fl oz	24	1	No more than 4 applications per year.
	4A	**Assail 30SG** (acetamiprid)	5.3 oz	26.5 oz	12	0	No more than 5 applications per season. Do not use with other group 4A insecticides. Application for squash bug are most effective against newly laid eggs and nymphs. Toxic to foraging bees.
	4A	**Belay Insecticide** (clothianidin)	Foliar: 3.0–4.0 fl oz Soil: 9.0–12.0 fl oz	12 fl oz	12	Foliar: Do not make application after 4th true leaf on main stem is unfolded Soil: 21	Do not apply when plants are blooming.
	4A	**Scorpion 35SL Insecticide** (dinotefuran)	Foliar: 2–7 fl oz Soil: 9–10.5 fl oz	Foliar: 10.5 fl oz Soil: 21 fl oz	12	Foliar: 1 Soil: 21	Use only 1 application method (soil or foliar). Do not use with other Group 4A insecticides. Highly toxic to foraging bees for 38 hr after application.
	4A	**Venom Insecticide** (dinotefuran)	Foliar: 1–4 oz Soil: 5–6 oz	Foliar: 6 oz Soil: 12 oz	12	Foliar: 1 Soil: 21	Highly toxic to foraging bees. Use only 1 application method (soil or foliar). Note that pests controlled differ depending on application method.
	4D	**Sivanto Prime** (flupyradifurone)	Foliar: 7–14 fl oz Soil: 21–28 fl oz	Foliar: 28 fl oz Soil: 28 fl oz per crop season	4	Foliar: 1 Soil: 21	Foliar: Reapplications at least 7 days apart. Soil: No more than 3 crop seasons per year.
	15	**Rimon 0.83EC** (novaluron)	9–12 fl oz	36 fl oz	12	1	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]
Thrips (check label for species controlled)	1A	**Vydate L** (oxamyl)	2–4 pt	12 pt	48	1	Reapplications at least 7 days apart.
	1B	**Dimethoate 4 EC** (dimethoate)	Melons: 1 pt Watermelons: 0.5–1 pt	2 pt per year	48	3	Highly toxic to bees. Not for squash or cucumber.
	4A	**Admire Pro** (imidacloprid) (see appropriate labels for other brands)	7–10.5 oz	10.5 fl oz	12	**Soil:** 21	Do not use with other Group 4A insecticides. Not for planthouse. Only for foliage feeding thrips; will not control thrips feeding on flowers.
	4A	**Platinum 75SG** (thiamethoxam)	5–11 fl oz **75SG:** 1.66–3.67 oz	11 fl oz **75SG:** 3.67 oz	12	30	For most crops that are not on the label, a 120-day plant-back interval must be observed. Highly toxic to foraging bees.
	4A	**Safari 20 SG** (dinotefuran)	3.5–5.5 fl oz	1.34 lb	12	–	For transplants in the greenhouse only.
	4A	**Scorpion 35SL Insecticide** (dinotefuran)	Foliar: 2–7 fl oz Soil: 9–10.5 fl oz	Foliar: 10.5 fl oz Soil: 21 fl oz	12	Foliar: 1 Soil: 21	Use only 1 application method (soil or foliar). Do not use with other Group 4A insecticides. Highly toxic to foraging bees for 38 hr after application.
	4A	**Venom Insecticide** (dinotefuran)	Foliar: 1–4 oz Soil: 5–7.5 oz	Foliar: 6 oz Soil: 12 oz	12	Foliar: 1 Soil: 21	Highly toxic to foraging bees. Use only 1 application method (soil or foliar). Pests controlled differ depending on application method.
	4A + 28	**Durivo** (thiamethoxam + chlorantraniliprole)	10–13 fl oz	13 fl oz	12	30	–
	5	**Entrust SC** (spinosad)	6–8 fl oz	29 fl oz	1	4	No more than 5 applications per year. OMRI-listed[2].
	5	**Radiant SC** (spinetoram)	6–10 fl oz	34 fl oz	4	3 Cucumbers: 1	No more than 6 applications. Toxic to bees for up to 3 hr following application.
	28	**Exirel** (cyantraniliprole)	13.5–20.5 fl oz	61.6 fl oz	12	1	No more than 0.4 lb a.i./A per crop, either as foliar or soil applications.

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]
Whitefly	1B	***Diazinon AG500 50W** (diazinon)	**AG500:** 2–4 qt **50W:** 4–8 lb	**AG500:** 4 qt **50W:** 8 lb	72	preplant	Melons and watermelons only. Not for squash or cucumbers. No more than 1 application per year.
	3A	***Athena** (bifenthrin)	13.5–17 fl oz	51 fl oz	12	7	Only for adults. No more than 2 consecutive applications. No more than 2 applications after bloom.
	3A	***Brigade 2 EC** (bifenthrin)	2.6–6.4 fl oz	19.2 fl oz	12	3	No more than 2 applications after bloom. Highly toxic to foraging bees.
	3A	***Capture LFR** (bifenthrin)	3.4–8.5 fl oz, at planting	8.5 fl oz	12	N/A—applied at planting	At planting, banded over open furrow or in-furrow with seed or transplant.
	3A	***Hero** (bifenthrin + zeta-cypermethrin)	10.3 oz	41.2 oz	12	3	No more than 4 applications per season. Reapplications at least 10 days apart.
	3A	**Pyganic Crop Protection EC 5.0** (pyrethrins)	4.5–15.61 oz	15.61 oz	12	0	Reapplications at least 10 days apart. OMRI-listed[2].
	4A	**Actara** (thiamethoxam)	1.5–5.5 oz	11.0 oz	12	0	Apply before pests reach damaging levels. Highly toxic to foraging bees.
	4A	**Admire Pro** (imidacloprid) (see appropriate labels for other brands)	7–10.5 oz Planthouse: 0.44 fl oz/10,000 plants	10.5 fl oz	12	Soil: 21	Do not use with other Group 4A insecticides. Planthouse: 1 application to transplants. See label for use on mature greenhouse cucumbers.
	4A	**Assail 30SG** (acetamiprid)	2.5–5.3 oz	26.5 oz	12	0	No more than 5 applications per season. Do not use with other group 4A insecticides. Toxic to foraging bees.
	4A	**Platinum 75SG** (thiamethoxam)	5–11 fl oz **75SG:** 1.66–3.67 oz	11 fl oz **75SG:** 3.67 oz	12	30	A 120-day plant-back interval must be observed. Highly toxic to foraging bees.
	4A	**Safari 20 SG** (dinotefuran)	3.5–5.5 fl oz	1.34 lb	12	–	For transplants in the greenhouse only.
	4A	**Scorpion 35SL Insecticide** (dinotefuran)	Foliar: 2–7 fl oz Soil: 9–10.5 fl oz	Foliar: 10.5 fl oz Soil: 21 fl oz	12	Foliar: 1 Soil: 21	Use only 1 application method (soil or foliar). Do not use with other Group 4A insecticides. Highly toxic to foraging bees for 38 hr after application.

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	**Venom Insecticide** (dinotefuran)	Foliar: 1–4 oz Soil: 5–7.5 oz	Foliar: 6 oz Soil: 12 oz	12	Foliar: 1 Soil: 21	Highly toxic to foraging bees. Use only 1 application method (soil or foliar). Pests controlled differ depending on application method.
	4A + 28	**Durivo** (thiamethoxam + chlorantraniliprole)	10–13 oz	13 oz	12	30	–
	4A + 28	**Voliam Flexi** (thiamethoxam + chlorantraniliprole)	4–7 oz	14 oz	12	1	–
	4C	**Closer SC** (sulfoxaflor)	4.25–4.5 fl oz	17 fl oz	12	1	Highly toxic against pollinators: Notify known beekeepers within 1 mile of the treatment area. Limit application to times when managed bees and native pollinators are least active.
	4D	**Sivanto Prime** (flupyradifurone)	Foliar: 10.5–14 fl oz Soil: 21–28 fl oz	Foliar: 28 fl oz Soil: 28 fl oz per crop season	4	Foliar: 1 Soil: 21	Foliar: Reapplications at least 7 days apart. Soil: No more than 3 crop seasons per year.
	6 + 28	***Minecto Pro** (abamectin + cyantraniliprole)	10 fl oz	20 fl oz	24	7	Restrictions exist for this label because of the risks to pollinators.
	7C	**Knack IGR** (pyriproxyfen)	8–10 fl oz	20 fl oz	12	7	Immatures only. Apply when nymphs first appear. No more than 2 applicatons per growing season.
	9B	**Fulfill** (pymetrozine)	2.75 oz	5.5 oz	12	0	Reapplications at least 7 days apart.
	9B	**PQZ** (pyrifluquinazon)	3.2 fl oz	9.6 fl oz	12	7	Reapplications at least 7 days apart.
	9D	**Sefina Inscalis Insecticide** (afidopyropen)	14 fl oz	28 fl oz	12	0	Reapplications at least 7 days apart. Maintain a 10-ft vegetative filter strip of permanent vegetation between the field edge and aquatic habitat.
	15	**Rimon 0.83EC** (novaluron)	9–12 fl oz	36 fl oz	12	1	Reapplications at least 14 days apart.
	16	**Courier 40SC** (buprofezin)	9.0–13.6 fl oz	27.2 fl oz	12	7	Immatures only. IGR. No more than 2 applications per season per crop or 4 per year.
	21A	**Magister** (fenazaquin)	24–36 fl oz	36 fl oz	12	3	No more than 1 application per year.
	23	**Oberon 2SC** (spiromesifen)	7.0–8.5 fl oz	25.5 fl oz	12	7	No more than 3 applications.

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	**Exirel** (cyantraniliprole)	13.5–20.5 fl oz	61.6 fl oz	12	1	No more than 0.4 lb a.i./A per crop, either as foliar or soil applications.
	28	**Verimark** (cyantraniliprole)	6.75–13.5 fl oz	**At planting:** 13.5 fl oz **Drip chemigation:** 20 fl oz (or 10 fl oz if at-plant also used)	4	1	Both at-plant and drip chemigation. No more than 2 drip chemigation applications (1 if at-plant application is used).

[1]Mode of Action (MOA) codes for plant pest insecticides from the Insecticide Resistance Action Committee (IRAC) Mode of Action Classification v. 11.1 January 2024. Number codes are used to distinguish the main insecticide mode of action groups, with additional letters for certain subgroups within each main group. All insecticides within the same group (with the same number) indicate the same active ingredient or similar mode of action. This information must be considered for the insecticide resistance management decisions. U = unknown, or a mode of action that has not been classified yet.
[2] Information provided in this table applies only to Florida. Be sure to read a current product label before applying any product. The use of brand names and any mention or listing of commercial products or services in the publication does not imply endorsement by UF/IFAS Extension nor discrimination against similar products or services not mentioned. OMRI-listed: Listed by the Organic Materials Review Institute for use in organic production.
*Restricted use insecticide.

Table 13. Cucurbit fungicides ordered by disease and then FRAC group according to their mode of action. **Please refer to chapter 19 for information on biopesticides, including materials labeled for certified organic production.** Contact: Nicholas S. Dufault, UF/IFAS Department of Plant Pathology, Gainesville; or Pamela Roberts, UF/IFAS Southwest Florida Research and Education Center.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
Alternaria leaf spot/blight	M1	(copper compounds) **Many brands available:** AmeriCop 40 DF, Badge SC, Badge X2, Basic Copper 53, BluLogic, Camelot-O, Champ DP Dry Prill, Champ Formula 2 FL, ChampION++, Champ WG, Copper-Count-N, CS 2005, Cueva, Cuprofix Ultra 40 Disperss, Cuproxat, ET-F, Grotto, Instill, Kalmor, Kentan DF, Kocide 2000, Kocide 2000-O, Kocide 3000, Kocide 3000-O, Kocide HCu, KOP-5, Kop-Hydroxide, MasterCop, Nordox 75WG, Nu-Cop 30 HB, Nu-Cop 3L, Nu-Cop 50 DF, Nu-Cop 50 WP, Nu-Cop HB, Nu-Cop XLR, Previsto	See label	See label	1	Varies from 4 hr to 2 days	Check label for specific guidelines.
	M1 + M3	**ManKocide** (copper hydroxide + mancozeb)	3 lb	24 lb	5	2	Some cantaloupe varieties are sensitive. Check label for details.
	M3	(mancozeb) **Many brands available:** Dithane DF Rainshield, Dithane F45 Rainshield, Dithane M45, Fortuna 75 WDG, Koverall, Mancozeb 75 WDG, Manzate Max, Manzate Pro-Stick, Penncozeb 75DF, Penncozeb 80WP, Protect DF, Roper DF Rainshield	See label	See label	5	1	Check label for specific guidelines.
	M5	(chlorothalonil) **Many brands available:** Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720 SC, Echo 720, Echo 90 DF, Echo Zn, Equus 720 SST, Equus DF, Initiate 720, Initiate ZN, Oranil 6 L, Periapt, Praiz, Rialto 720 F	See label	See label	0	1	Check label for crop-specific guidelines. Follow label recommendations on watermelon after fruit set. Do not apply to mature watermelons under dry, hot, and other environmental conditions as indicated on the label.
	M5 + 27	**Ariston** Cymbol Advance (chlorothalonil + cymoxanil)	3 pt	17.5 pt per year	3	0.5	Apply preventatively when conditions are favorable for disease outbreak. Do not apply to mature watermelons under dry, hot, or other environmental conditions as indicated on the label.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	M5 + 49	**Orondis Opti** (chlorothalonil + oxathiapiprolin)	2.5 pt	10 pt per year	0	0.5	Check label for additional guidelines. No more than 2 sequential applications before rotating to a fungicide with different mode of action.
	P4	**Vacciplant** (laminarin)	22 fl oz	See label	0	4 hr	Initiate as preventative application.
	3	**Cevya** **Provysol** (mefentrifluconazole)	5 fl oz	15 fl oz per year	0	0.5	Reapplications at least 7 days apart.
	3	**Mettle 125 ME** (tetraconazole)	8 fl oz	24 fl oz per year	1	0.5	No more than 2 sequential applications before rotating to another fungicide with alternate mode of action.
	3 + 9	**Inspire Super** (difenoconazole + cyprodinil)	20 fl oz	80 fl oz per year	7	0.5	No more than 2 consecutive applications. Greenhouse use only for cucumber.
	4 + M5	**Ridomil Gold Bravo SC** (mefenoxam + chlorothalonil)	3.25 pt	See label	0	2	No more than 4 applications per crop.
	7	**Endura** (boscalid)	6.5 oz	26 oz per year	0	0.5	–
	7	**Fontelis** (penthiopyrad)	16 fl oz	67 fl oz per year	1	0.5	Maximum rate is for the year. No more than 2 applications sequentially with any FRAC 7 containing fungicide. See label for rates for greenhouse use.
	7 + 3	**Aprovia Top** (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz per year	0	0.5	See label for guidelines.
	7 + 3	**Luna Experience** (fluopryram + tebuconazole)	17 fl oz	34 fl oz per year	7	0.5	No more than 2 sequential applications before rotating to a non-FRAC 7, non-FRAC 3 fungicide.
	7 + 3	**Luna Flex** (fluopyram + difenoconazole)	8 fl oz	27.2 fl oz per year	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC 7.
	7 + 11	**Luna Sensation** (fluopryram + trifloxystrobin)	7.6 fl oz	27.1 fl oz per year	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC 7, non-FRAC 11 fungicide.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	7 + 11	**Merivon** (fluxapyroxad + pyraclostrobin)	5.5 fl oz	16.5 fl oz per year	0	0.5	See label.
	7 + 11	**Pristine** **Empire** (boscalid + pyraclostrobin)	18.5 oz	74 oz per year	0	0.5	See label.
	7 + 12	**Miravis Prime** (pydiflumetofen + fludioxonil)	11.4 fl oz	22.8 fl oz per year	1	0.5	No more than 2 applications of Miravis Prime or other Group 7 and 12 before alternation with a fungicide that is not in Group 7 or 12.
	9	**Vango WG** (cyprodinil)	7 oz	28 oz per year	1	0.5	Alternate with fungicide in another FRAC group after 2 applications.
	9 + 12	**Alterity 62.5** **Switch 62.5WG** (cyprodinil + fludioxonil)	14 oz	56 oz per year	1	0.5	No more than 2 consecutive applications.
	11	(azoxystrobin) **Many brands available:** Acadia 2 SC, Aframe, Arius 250, A-Zox 25SC, Azoxy 2SC, Azoxy 2SC Prime, AzoxyStar, Azoxyzone, AZteroid FC, AZteroid FC 3.3, Cadera, Dexter SC, Gold Rush, Heritage, Heritage SC, Mazolin, Quadris, Satori, Tetraban, Trevo	See label	See label	1	4 hr	No more than 4 applications per crop and alternate chemistry. See label for tank-mixing restrictions. Heritage and Heritage SC fungicides are only for transplants production. See label for details.
	11	**Cabrio EG** (pyraclostrobin)	16 oz	64 oz	0	0.5	See label for tank-mixing restrictions.
	11	**Evito 480 SC** **Tepera** (fluoxastrobin)	See label	See label	See label	See label	–
	11	**Reason 500 SC** (fenamidone)	5.5 fl oz	22 fl oz per year	14	0.5	Do not make more than 1 application of Reason 500 SC Fungicide before alternating with a fungicide from a different resistance management group.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	11 + M3	**Dexter Max** (mancozeb + azoxystrobin)	3.2 lb	12.8 lb per year	5	1	See guidelines of adjuvants and pesticides to be avoided in tank-mixing. No more than 1 application of Dexter Max or other group 11 fungicides before alternation with fungicides not in group 11.
	11 + M5	**Arius ADV** **Quadris Opti** (azoxystrobin + chlorothalonil)	3.2 pt	See label	1	0.5	Limit is 4 applications per crop for all QoI fungicides. No more than 1 consecutive application. Do not apply to mature watermelons under dry, hot, or other environmental conditions listed on label.
	11 + 3	**Acadia ESQ** **Quadris Top** (azoxystrobin + difenoconazole)	14 fl oz	56 fl oz per year	1	0.5	Must be rotated with a non-QoI-containing fungicide.
	11 + 3	**Topguard EQ** (azoxystrobin + flutriafol)	8 fl oz	See label	1	0.5	See label for crop-specific use.
	11 + 7	**Mural** (azoxystrobin + benzovindiflupyr)	See label	See label	0	0.5	Only for vegetable plants grown for resale to consumers.
	12	**Emblem** **Spirato** (fludioxonil)	7 fl oz	28 fl oz per year	1	0.5	–
	19	**Affirm WDG** **PH-D** (polyoxin D zinc salt)	6.2 oz	See label	0	4 hr	–
	22 + M3	**Gavel 75DF** (zoxamide + mancozeb)	2 lb	16 lb per year	5	2	No more than 8 applications per crop. Some cantaloupes are sensitive. See label.
	22 + M5	**Zing!** (zoxamide + chlorothalonil)	36 fl oz	See label	0	0.5	–
	27 + 11	**Tanos** (cymoxanil + famoxadone)	8 oz	See label	3	0.5	No more than 4 applications per crop. Must tank-mix with a contact fungicide.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	29	**Lektivar 40 SC** **Omega 500 F** **Orbus 4 F** **Omavo** **Oxelid 4 F** (fluazinam)	24 fl oz	See label	See label	0.5	See label for crop-specific guidelines.
	33	**K-Phite** **Fungi-Phite** **Reliant** (phosphorous acid and salts)	See label	See label	0	4 hr	Check label for guidelines on foliar and aerial applications, as well as preventative and control programs. Reapplications at least 3 days apart. Check label to see whether it is suppression of disease only.
	39	**Magister SC** (fenazaquin)	36 fl oz	36 fl oz	3	0.5	Also labeled as an acaricide. Note warning to bees and insect pollinators. No more than 1 application per year. Foliar suppression only.
Angular leaf spot	M1	(copper compounds) **Many brands available:** AmeriCop 40 DF, Badge SC, Badge X2, Basic Copper 53, BluLogic, Camelot-O, Champ DP Dry Prill, Champ Formula 2 FL, ChampION++, Champ WG, Copper-Count-N, CS 2005, Cueva, Cuprofix Ultra 40 Disperss, Cuproxat, Grotto, ET-F, Instill, Kalmor, Kentan DF, Kocide 2000, Kocide 2000-O, Kocide 3000, Kocide 3000-O, Kocide HCu, KOP-5, Kop-Hydroxide, MasterCop, Nordox 75WG, Nu-Cop 3L, Nu-Cop 30 HB, Nu-Cop 50DF, Nu-Cop 50 WP, Nu-Cop HB, Nu-Cop XLR, Previsto, Stretch	See label	See label	1	Varies from 4 hrs to 2 days	Check label for crop-specific guidelines.
	M1 + M3	**Mankocide** (copper hydroxide + mancozeb)	3 lb	24 lb	5	2	Some cantaloupe varieties are sensitive. See label for details.
	P1	**Actigard 50WG** (acibenzolar-S-methyl)	1 oz	8 oz per year	0	0.5	Apply preventatively prior disease development. Suppression of disease.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
Anthracnose (*Colletotrichum* spp.)	M1	(copper compounds) **Many brands available:** AmeriCop 40 DF, Badge SC, Badge X2, Basic Copper 53, BluLogic, Camelot-O, Champ DP Dry Prill, Champ Formula 2 FL, ChampION++, Champ WG, C-O-C-S WDG, Copper-Count-N, CS 2005, Cueva, Cuprofix Ultra 40 Disperss, Cuproxat, Grotto, ET-F, Instill, Kalmor, Kentan DF, Kocide 2000, Kocide 2000-O, Kocide 3000, Kocide 3000-O, Kocide HCu, KOP-5, Kop-Hydroxide, MasterCop, Nordox 50WP, Nordox 75WG, Nu-Cop 3L, Nu-Cop 30 HB, Nu-Cop 50 DF, Nu-Cop HB, Nu-Cop XLR, Previsto, Stretch	See label	See label	1	Varies from 4 hrs to 2 days	Check label for crop-specific guidelines.
	M1 + M3	**Mankocide** (copper hydroxide + mancozeb)	3 lb	24 lb	5	2	Some cantaloupe varieties are sensitive. See label for details.
	M3	(mancozeb) **Many brands available:** Dithane DF Rainshield, Dithane F45 Rainshield, Dithane M45, Fortuna 75WDG, Koverall, Manzate Max, Manzate Pro-Stick, Penncozeb 75DF, Penncozeb 80WP, Protect DF, Roper DF Rainshield	See label	See label	5	1	Check label for crop-specific guidelines.
	M3 + 11	**Dexter Max** (mancozeb + azoxystrobin)	3.2 lb	12.8 lb per year	5	1	See guidelines of adjuvants and pesticides to be avoided in tank-mixing. No more than 1 application of Dexter Max or other group 11 fungicides before alternation with fungicides not in group 11.
	M5	(chlorothalonil) **Many brands available:** Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720 SC, Echo 720, Echo 90 DF, Echo ZN, Equus 720 SST, Equus DF, Initiate 720, Initiate ZN, Oranil 6L, Orondis Opti B, Periapt, Praiz, Rialto 720 F	See label	See label	0	1	Check label for crop-specific guidelines. Follow label recommendations on watermelon after fruit set. Do not apply to mature watermelons under dry, hot, or other environmental conditions indicated on the label.
	M5 + 4	**Ridomil Gold Bravo SC** (mefenoxam + chlorothalonil)	3.25 pt	See label	0	2	No more than 4 applications per crop.
	M5 + 27	**Ariston** **Cymbol Advance** (chlorothalonil + cymoxanil)	3 pt	17.5 pt per year	3	0.5	Spraying on mature watermelon may cause sun burn.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	M5 + 49	**Orondis Opti** (chlorothalonil + oxathiapiprolin)	2.5 pt	10 pt per year	0	0.5	Check label for additional guidelines. No more than 2 sequential applications before rotating to a fungicide with different mode of action.
	1	(thiophanate-methyl) **Many brands available:** 3336 EG, 3336 F, 3336 WP, Cercobin, Incognito 4.5F, Incognito 85 WDG, T-Methyl 4.5 AG, T-Methyl 4.5 F, T-Methyl 70 WP, Talaris 4.5F, Talaris 70 WSB, Thiophanate methyl 85 WDG, TM 4.5 F, Topsin 4.5 FL, Topsin M WSB	See label	See label	1	1	Follow resistance management guidelines on label. Check label for additional guidelines.
	3 + 9	**Inspire Super** (cyprodinil + difenoconazole)	20 fl oz	80 fl oz per year	7	0.5	No more than 2 consecutive applications. See label for greenhouse use only for cucumber.
	7 + 3	**Aprovia Top** (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz per year	0	0.5	See label for guidelines.
	7 + 3	**Luna Experience** (fluopyram + tebuconazole)	17 fl oz	34 fl oz per year	7	0.5	No more than 2 sequential applications before rotating to a non-FRAC 7, non-FRAC 3 fungicide.
	7 + 3	**Luna Flex** (fluopyram + difenoconazole)	8 fl oz	27.2 fl oz per year	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC 7.
	7 + 11	**Luna Sensation** (fluopyram + trifloxystrobin)	7.6 fl oz	27.1 fl oz per year	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC 7, non-FRAC 11 fungicide.
	7 + 11	**Merivon** (fluxapyroxad + pyraclostrobin)	5.5 fl oz	16.5 fl oz per year	0	0.5	See label.
	7 + 11	**Pristine** **Empire** (boscalid + pyraclostrobin)	18.5 oz	74 oz per year	0	0.5	See label.
	11	(azoxystrobin) **Many brands available:** Acadia 2 SC, Aframe, A-Zox 25 SC, Azoxy 2SC, Azoxy 2SC Prime, AzoxyStar, Azoxyzone, AZteroid FC, AZteroid FC 3.3, Heritage, Heritage SC, Mazolin, Quadris, Satori, Tetraban, Trevo	See label	See label	1	4 hr	No more than 4 applications per crop and alternate chemistry. See label for tank-mixing restrictions. Heritage and Heritage SC fungicides are only for transplant production. See label for details.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	11	**Cabrio EG** (pyraclostrobin)	16 oz	64 oz	0	0.5	See label for tank-mixing restrictions.
	11	**Evito 480 SC** **Tepera** (fluoxastrobin)	See label	See label	See label	See label	–
	11 + M5	**Arius ADV** **Quadris Opti** (azoxystrobin + chlorothalonil)	3.2 pt	See label	1	0.5	No more than 4 applications per crop for all QoI fungicides. No more than 1 consecutive application. Do not apply to mature watermelons under dry, hot, or other environmental conditions listed on label.
	11 + 3	**Quadris Top** (azoxystrobin + difenoconazole)	14 fl oz	56 fl oz per year	1	0.5	Must be rotated with a non-QoI-containing fungicide.
	11 + 3	**Topguard EQ** (azoxystrobin + flutriafol)	8 fl oz	See label	1	0.5	See label for crop-specific use.
	11 + 7	**Mural** (azoxystrobin + benzovindiflupyr)	See label	See label	0	0.5	Only for vegetable plants grown for resale to consumers.
	19	**Oso 5% SC** (polyoxin D zinc salt)	13.0 fl oz	See label	0	4 hr	–
	22 + M5	**Zing!** (zoxamide + chlorothalonil)	36 fl oz	See label	0	0.5	–
	27 + 11	**Tanos** (cymoxanil + famoxadone)	8 oz	See label	3	0.5	No more than 4 applications per crop. Must tank-mix with a contact fungicide. See label.
Bacterial fruit blotch	M1	(copper compounds) **Many brands available:** Americop 40 DF, Badge SC, Badge X2, Basic Copper 53, Camelot-O, Champ DP Dry Prill, Champ Formula 2 FL, ChampION++, Champ WG, Copper-Count-N, CS 2005, Cueva, Cuprofix Ultra 40 Disperss, Cuproxat, ET-F, Grotto, Kentan DF, Kocide 2000, Kocide 2000-O, Kocide 3000, Kocide 3000-O, Kocide HCu, KOP-5, Kop-Hydroxide, MasterCop, Nordox 75 WG, Nu-Cop, Nu-Cop 3L, Nu-Cop 30HB, Nu-Cop 50 DF, Nu-Cop 50 WP, Nu-Cop HB, Previsto, Stretch	See label	See label	1	Varies from 4 hr to 2 days	Suppression only. Check label for crop-specific guidelines.
	M1 + M3	**Mankocide** (copper hydroxide + mancozeb)	3 lb	24 lb	5	2	Some cantaloupe varieties are sensitive. See label for details.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	P1	**Actigard 50WG** (acibenzolar-S-methyl)	1 oz	8 oz per year	0	0.5	Apply preventatively prior to disease development. Suppression of disease.
	27 + 11	**Tanos** (cymoxanil + famoxadone)	10 oz	See label	3	0.5	No more than 4 applications per crop. Must tank-mix with a contact fungicide. Bacterial fruit blotch disease suppression only.
Belly rot	M3 + 11	**Dexter Max** (mancozeb + azoxystrobin)	3.2 lb	12.8 lb per year	5	1	See guidelines of adjuvants and pesticides to be avoided in tank-mixing. No more than 1 application of Dexter Max or other group 11 fungicides before alternation with fungicides not in group 11.
	1	(thiophanate-methyl) **Many brands available:** 3336 EG, 3336 F, 3336 WP, Cercobin, Incognito 4.5F, Incognito 85WDG, Miramar, Talaris 70 WSB, Thiophanate methyl 85 WDG, TM 4.5 F, T-Methyl 4.5 AG, T-Methyl 4.5 F, T-Methyl 70 WP, Topsin 4.5 FL, Topsin M WSB	See label	See label	1	1	Follow resistance management guidelines on label.
	7 + 3	**Aprovia Top** (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz per year	0	0.5	See label for guidelines.
	7 + 3	**Luna Experience** (fluopryram + tebuconazole)	17 fl oz	34 fl oz per year	7	0.5	No more than 2 sequential applications before rotating to a non-FRAC 7, non-FRAC 3 fungicide.
	7 + 11	**Luna Sensation** (fluopryram + trifloxystrobin)	7.6 fl oz	27.1 fl oz per year	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC 7, non-FRAC 11 fungicide.
	11	(azoxystrobin) **Many brands available:** Acadia 2 SC, Aframe, A-Zox 25SC, Azoxy 2 SC, Azoxy 2SC Prime, AzoxyStar, Azoxyzone, AZteroid FC, AZteroid FC 3.3, Heritage, Heritage SC, Mazolin, Quadris, Satori, Tetraban, Trevo	See label	See label	1	4 hr	No more than 4 applications per crop and alternate chemistry. See label for tank-mixing restrictions. Heritage and Heritage SC fungicides are only for transplants production. See label for details.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	11	**Evito 480 SC** **Tepera** (fluoxastrobin)	See label	See label	See label	See label	–
	11 + M5	**Arius ADV** **Quadris Opti** (azoxystrobin + chlorothalonil)	3.2 pt	See label	1	0.5	No more than 4 applications per crop for all QoI fungicides. No more than 1 consecutive application. Do not apply to mature watermelons under dry, hot, or other environmental conditions listed on label.
	11 + 3	**Quadris Top** (azoxystrobin + difenoconazole)	14 fl oz	56 fl oz per year	1	0.5	Must be rotated with a non-QoI-containing fungicide.
	11 + 3	**Topguard EQ** (azoxystrobin + flutriafol)	8 fl oz	See label	1	0.5	See label for crop-specific use.
	19	**PH-D** (polyoxin D zinc salt)	6.2 oz	See label	0	4 hr	–
Cercospora leaf spot	M1 + M3	**Mankocide** (copper hydroxide + mancozeb)	3 lb	24 lb	5	2	Some cantaloupe varieties are sensitive. Check label for details.
	M3	(mancozeb) **Many brands available:** Dithane DF Rainshield, Dithane F45 Rainshield, Dithane M45, Fortuna 75WDG, Koverall, Manzate Max, Manzate Pro-Stick, Penncozeb 75DF, Penncozeb 80WP, Protect DF, Roper DF Rainshield	See label	See label	5	1	Check label for crop-specific guidelines.
	M3 + 11	**Dexter Max** (mancozeb + azoxystrobin)	3.2 lb	12.8 lb per year	5	1	See guidelines of adjuvants and pesticides to be avoided in tank-mixing. No more than 1 application of Dexter Max or other group 11 fungicides before alternation with fungicides not in group 11.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	M5	(chlorothalonil) **Many brands available:** Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720 SC, Echo 720, Echo 90 DF, Echo ZN, Equus 720 SST, Equus DF, Initiate 720, Initiate ZN, Oranil 6L, Orondis Opti B, Periapt, Praiz, Rialto 720 F	See label	See label	0	1	Check label for crop-specific guidelines. Follow label recommendations on watermelon after fruit set. Do not apply to mature watermelons under dry, hot, or other environmental conditions indicated in the label.
	M5 + 4	**Ridomil Gold Bravo SC** (mefenoxam + chlorothalonil)	3.25 pt	See label	0	2	No more than 4 applications per crop.
	M5 + 27	**Ariston** **Cymbol Advance** (chlorothalonil + cymoxanil)	3 pt	17.5 pt per year	3	0.5	–
	M5 + 49	**Orondis Opti** (chlorothalonil + oxathiapiprolin)	2.5 pt	10 pt per year	0	0.5	Check label for additional guidelines. No more than 2 sequential applications before rotating to a fungicide with different mode of action.
	3	**Mettle 125 ME** (tetraconazole)	8 fl oz	24 fl oz per year	1	0.5	No more than 2 sequential applications before rotating to another fungicide with alternate mode of action.
	3 + 9	**Inspire Super** (cyprodinil + difenoconazole)	20 fl oz	80 fl oz per year	7	0.5	No more than 2 consecutive applications. See label for greenhouse use only for cucumber.
	7 + 3	**Luna Flex** (fluopyram + difenoconazole)	8 fl oz	27.2 fl oz per year	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC 7.
	7 + 3	**Aprovia Top** (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz per year	0	0.5	See label for guidelines.
	7 + 11	**Merivon** (fluxapyroxad + pyraclostrobin)	5.5 fl oz	16.5 fl oz per year	0	0.5	See label.
	7 + 11	**Pristine** **Empire** (boscalid + pyraclostrobin)	18.5 oz	74 oz per year	0	0.5	See label.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	7 + 12	**Miravis Prime** (pydiflumetofen + fludioxonil)	11.4 fl oz	22.8 fl oz per year	1	0.5	No more than 2 applications of Miravis Prime or other Group 7 and 12 before alternation with a fungicide that is not in Group 7 or 12.
	11	(azoxystrobin) **Many brands available:** Acadia 2SC, Aframe, A-Zox 25SC, Azoxy 2SC, Azoxy 2SC Prime, AzoxyStar, Azoxyzone, AZteroid FC, AZteroid FC 3.3, Heritage, Heritage SC, Quadris, Satori, Tetraban, Trevo	See label	See label	1	4 hr	No more than 4 applications per crop and alternate chemistry. See label for tank-mixing restrictions. Heritage and Heritage SC fungicides are only for transplants production. See label for details.
	11	**Cabrio EG** (pyraclostrobin)	16 oz	64 oz	0	0.5	See label for tank-mixing restrictions.
	11	**Evito 480 SC** **Tepera** (fluoxastrobin)	See label	See label	See label	See label	–
	11 + M5	**Arius ADV** **Quadris Opti** (azoxystrobin + chlorothalonil)	3.2 pt	See label	1	0.5	No more than 4 applications per crop for all QoI fungicides. No more than 1 consecutive application. Do not apply to mature watermelons under dry, hot, or other environmental conditions listed on label.
	11 + 3	**Quadris Top** (azoxystrobin + difenoconazole)	14 fl oz	56 fl oz per year	1	0.5	Must be rotated with a non-QoI-containing fungicide.
	11 + 3	**Topguard EQ** (azoxystrobin + flutriafol)	8 fl oz	See label	1	0.5	See label for crop-specific use.
	11 + 7	**Mural** (azoxystrobin + benzovindiflupyr)	See label	See label	0	0.5	Only for vegetable plants grown for resale to consumers.
	22 + M3	**Gavel 75DF** (zoxamide + mancozeb)	2 lb	16 lb per year	5	2	No more than 8 applications per crop. Some cantaloupes are sensitive. See label.
	22 + M5	**Zing!** (zoxamide + chlorothalonil)	36 fl oz	See label	0	0.5	–

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
Downy mildew	M1	(copper compounds) **Many brands available:** Americop 40 DF, Badge SC, Badge X2, Basic Copper 53, Camelot-O, Champ DP Dry Prill, Champ Formula 2 FL, ChampION++, Champ WG, Copper-Count-N, CS 2005, Cueva, Cuprofix Ultra 40 Disperss, Cuproxat, ET-F, Grotto, Instill, Kalmor, Kentan DF, Kocide 2000, Kocide 2000-O, Kocide 3000, Kocide 3000-O, Kocide HCu, KOP-5, Kop-Hydroxide, MasterCop, Nordox 75 WG, Nu-Cop, Nu-Cop 3L, Nu-Cop 30HB, Nu-Cop 50 DF, Nu-Cop 50 WP, Nu-Cop HB, Previsto, Stretch	See label	See label	1	Varies from 4 hr to 2 days	Check label for crop-specific guidelines.
	M1 + M2	**Top Cop w Sulfur** (copper + sulfur)	1 qt	See label	–	1	Do not apply if air temperatures greater than 90°F are expected.
	M1 + M3	**Mankocide** (copper hydroxide + mancozeb)	3 lb	24 lb	5	2	Some cantaloupe varieties are sensitive. Check label for details.
	M3	(mancozeb) **Many brands available:** Dithane DF Rainshield, Dithane F45 Rainshield, Dithane M45, Fortuna 75WDG, Koverall, Manzate Max, Manzate Pro-Stick, Penncozeb 75DF, Penncozeb 80WP, Protect DF, Roper DF Rainshield	See label	See label	5	1	Check label for crop-specific guidelines.
	M3 + 11	**Dexter Max** (mancozeb + azoxystrobin)	3.2 lb	12.8 lb per year	5	1	See guidelines of adjuvants and pesticides to be avoided in tank-mixing. No more than 1 application of Dexter Max or other group 11 fungicides before alternation with fungicides not in group 11.
	M5	(chlorothalonil) **Many brands available:** Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720 SC, Echo 720, Echo 90 DF, Echo ZN, Equus 720 SST, Equus DF, Initiate 720, Initiate ZN, Oranil 6L, Orondis Opti B, Periapt, Praiz, Rialto 720 F	See label	See label	0	1	Check label for crop-specific guidelines. Follow label recommendations on watermelon after fruit set. Do not apply to mature watermelons under dry, hot, or other environmental conditions indicated in the label.
	M5 + 27	**Ariston** **Cymbol Advance** (chlorothalonil + cymoxanil)	3 pt	17.5 pt per year	3	0.5	–

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	M5 + 49	**Orondis Opti** (chlorothalonil + oxathiapiprolin)	2.5 pt	10 pt per year	0	0.5	Check label for additional guidelines. No more than 2 sequential applications before rotating to a fungicide with different mode of action.
	P1	**Actigard 50WG** (acibenzolar-S-methyl)	1 oz	8 oz per year	0	0.5	Apply preventatively prior disease development. Suppression of disease.
	P4	**Vacciplant** (laminarin)	22 fl oz	See label	0	4 hr	Initiate as preventative application.
	3 + 33	**Viathon** (tebuconazole + potassium phosphite)	4 pt	12 pt	7	0.5	Watermelon only. See label.
	4 + M1	**Ridomil Gold Copper** (mefenoxam + copper hydroxide)	2 lb	8 lb	5	2	No more than 4 applications per crop.
	4 + M3	**Ridomil Gold MZ WG** (mancozeb + mefenoxam)	2.5 lb	10 lb	5	2	No more than 4 applications per crop. Rate is for downy mildew.
	4 + M5	**Ridomil Gold Bravo SC** (mefenoxam + chlorothalonil)	2.5 pt	See label	0	2	No more than 4 applications per crop.
	7 + 11	**Merivon** (fluxapyroxad + pyraclostrobin)	5.5 fl oz	16.5 fl oz per year	0	0.5	See label
	7 + 11	**Pristine** **Empire** (boscalid + pyraclostrobin)	18.5 oz	74 oz per year	0	0.5	See label.
	11	(azoxystrobin) **Many brands available:** Acadia 2SC, Aframe, A-Zox 25SC, Azoxy 2SC, Azoxy 2SC Prime, AzoxyStar, Azoxyzone, AZteroid FC, AZteroid FC 3.3, Heritage, Heritage SC, Mazolin, Quadris, Satori, Tetraban, Trevo	See label	See label	1	4 hr	No more than 4 applications per crop and alternate chemistry. See label for tank-mixing restrictions. Heritage and Heritage SC fungicides are only for transplants production. See label for details.
	11	**Cabrio EG** (pyraclostrobin)	12 oz	64 oz	0	0.5	See label for tank-mixing restrictions.
	11	**Evito 480 SC** **Tepera** (fluoxastrobin)	See label	See label	See label	See label	–

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	11	**Flint Extra** **Flint** (trifloxystrobin)	See label	See label	See label	0.5	For disease suppression. No more than 4 applications per crop and alternate chemistry.
	11	**Reason 500SC** (fenamidone)	5.5 fl oz	22 fl oz	14	0.5	See label.
	11 + M5	**Arius ADV** **Quadris Opti** (azoxystrobin + chlorothalonil)	3.2 pt	See label	1	0.5	No more than 4 applications per crop for all QoI fungicides. No more than 1 consecutive application. Do not apply to mature watermelons under dry, hot, or other environmental conditions listed on label.
	11 + 3	**Quadris Top** (azoxystrobin + difenoconazole)	14 fl oz	56 fl oz per year	1	0.5	Must be rotated with a non-QoI-containing fungicide.
	11 + 3	**Topguard EQ** (azoxystrobin + flutriafol)	8 fl oz	See label	1	0.5	See label for crop-specific use.
	11 + 7	**Mural** (azoxystrobin + benzovindiflupyr)	See label	See label	0	0.5	Only for vegetable plants grown for resale to consumers.
	19	**Oso 5% SC** (polyoxin D zinc salt)	13.0 fl oz	See label	0	4 hr	–
	21	**Ranman** **Ranman 400 SC** (cyazofamid)	2.75 fl oz	16.5 fl oz	0	0.5	No more than 6 applications per crop. Follow resistance management guidelines.
	22	**Elumin** (ethaboxam)	8 fl oz	16 fl oz per year	1	0.5	Reapplications at least 14 days apart.
	22 + M3	**Gavel 75DF** (zoxamide + mancozeb)	2 lb	16 lb per year	5	2	No more than 8 applications per crop. Some cantaloupes are sensitive. See label.
	22 + M5	**Zing!** (zoxamide + chlorothalonil)	36 fl oz	See label	0	0.5	–
	27	**Curzate 60DF** **Cymbol** (cymoxanil)	See label	See label	3	0.5	Use only with a labeled rate of protectant fungicide.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	27 + 11	**Tanos** (cymoxanil + famoxadone)	8 oz	See label	3	0.5	No more than 4 applications per crop. Must tank-mix with a contact fungicide.
	28	**Previcur Flex** **Promess** (propamocarb hydrochloride)	1.2 pt	6 pt	2	0.5	See label for instructions.
	29	**Omega 500 F** **Lektivar 40 SC** **Omavo** **Orbus 4 F** (fluazinam)	24 fl oz	See label	7	0.5	See label for crop-specific guidelines.
	33	**Aliette 80WDG, Alude, Fosphite, Fungi-Phite, K-Phite 7 LP, Linebacker WDG, Prophyt, Reliant** (fosetyl-Al, phosphorous acid and salts)	See label	See label	See label	See label	See label for specific product guidelines.
	40	**Forum** (dimethomorph)	6 oz	30 oz	See label	0.5	No more than 5 applications per crop. Apply with another fungicide that has a different mode of action and alternate.
	40	**Orondis Ultra B** **Revus** (mandipropamid)	8 fl oz	32 fl oz	0	4 hr	See label. For suppression only.
	43	**Presidio** (fluopicolide)	4 fl oz	8 fl oz per year	2	0.5	Tank-mix with another fungicide product with a different FRAC code.
	45 + 40	**Zampro** (ametoctradin + dimethomorph)	14 fl oz	42 fl oz per year	0	0.5	No more than 2 sequential applications. Addition of a spreading/penetrating adjuvant is recommended.
	49	**Orondis Opti A** **Orondis Ultra A** (oxathiapiprolin)	4.8 fl oz	19.2 fl oz per year	0	4 hr	Cucurbit vegetables, crop group 9. See label.
	49 + 40	**Orondis Ultra** (oxathiapiprolin + mandipropamid)	8 fl oz	32 fl oz per year	0	4 hr	No more than 2 sequential applications before rotating to a fungicide with a different mode of action. Check label for additional details.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
Gummy stem blight (*Didymella bryoniae*)	M1	(copper compounds) **Many brands available:** AmeriCop 40 DF, Badge SC, Badge X2, Basic Copper 53, Camelot-O, Champ DP Dry Prill, Champ Formula 2 FL, ChampION++, Champ WG, Copper-Count-N, CS 2005, Cueva, Cuprofix Ultra 40 Disperss, Cuproxat, ET-F, Grotto, Kalmor, Kentan DF, Kocide 2000, Kocide 2000-O, Kocide 3000, Kocide 3000-O, Kocide HCu, KOP-5, Kop-Hydroxide, MasterCop, Nordox 75WG, Nu-Cop 3L, Nu-Cop 30 HB, Nu-Cop 50DF, Nu-Cop 50 WP, Nu-Cop HB, Nu-Cop XLR, Previsto	See label	See label	1	Varies from 4 hr to 2 days	Check label for crop-specific guidelines.
	M1 + M3	**Mankocide** (copper hydroxide + mancozeb)	3 lb	24 lb	5	2	Some cantaloupe varieties are sensitive. Check label for details.
	M3	(mancozeb) **Many brands available:** Dithane DF Rainshield, Dithane F45 Rainshield, Dithane M45, Fortuna 75WDG, Koverall, Manzate Max, Manzate Pro-Stick, Penncozeb 75DF, Penncozeb 80WP, Protect DF, Roper DF Rainshield	See label	See label	5	1	Check label for crop-specific guidelines.
	M3 + 11	**Dexter Max** (mancozeb + azoxystrobin)	3.2 lb	12.8 lb per year	5	1	See guidelines of adjuvants and pesticides to be avoided in tank-mixing. No more than 1 application of Dexter Max or other group 11 fungicides before alternation with fungicides not in group 11.
	M5	(chlorothalonil) **Many brands available:** Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720 SC, Echo 720, Echo 90 DF, Echo ZN, Equus 720 SST, Equus DF, Initiate 720, Initiate ZN, Oranil 6L, Orondis Opti B, Periapt, Praiz, Rialto 720F	See label	See label	0	1	Check label for crop-specific guidelines. Follow label recommendations on watermelon after fruit set. Do not apply to mature watermelons under dry, hot, or other environmental conditions indicated in the label.
	M5 + 27	**Ariston** (chlorothalonil + cymoxanil)	3 pt	17.5 pt per year	3	0.5	–
	M5 + 49	**Orondis Opti** (chlorothalonil + oxathiapiprolin)	2.5 pt	10 pt per year	0	0.5	Check label for additional guidelines. No more than 2 sequential applications before rotating to a fungicide with different mode of action.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	1	(thiophanate-methyl) **Many brands available:** 3336 EG, 3336 F, 3336 WP, Cercobin, Incognito 4.5F, Incognito 85WDG, Miramar, Talaris 70 WSB, Thiophanate methyl 85 WDG, TM 4.5 F, T-Methyl 4.5 AG, T-Methyl 4.5 F, T-Methyl 70 WP, Topsin 4.5 FL, Topsin M WSB	See label	See label	1	1	Follow resistance management guidelines on label.
	3	**Cevya** **Provysol** (mefentrifluconazole)	5 fl oz	15 fl oz per year	0	0.5	Reapplications at least 7 days apart.
	3	**Mettle 125 ME** (tetraconazole)	8 fl oz	24 fl oz per year	1	0.5	No more than 2 sequential applications before rotating to another fungicide with alternate mode of action.
	3	**Proline** (prothioconazole)	5.7 fl oz	17.1 fl oz per year	7	0.5	No more than 1 soil application and 2 foliar applications per year.
	3	**Rhyme** (flutriafol)	7 fl oz	28 fl oz per year	0	0.5	No more than 2 sequential applications before rotating with a different FRAC group fungicide.
	3	(tebuconazole) **Many brands available:** Buzz Ultra DF, Incognito 4.5F, Monsoon, Onset 3.6L, Orius 3.6F, Teb 3.6 SC, Tebu-Crop 3.6F, Tebu 3.6F, Tebuconazole 3.6 F, Tebustar 3.6L, Tebuzol 3.6F, Toledo, Vibe	See label	See label	1	1	Follow resistance management guidelines indicated on the label. Check label for additional guidelines.
	3	**Topguard** (flutriafol)	14 fl oz	56 fl oz per year	0	0.5	Check label.
	3 + M5	**Muscle ADV** (tebuconazole + chlorothalonil)	2.1 pt	6.4 pt	7	0.5	Watermelon, squash, pumpkin, and melon
	3 + 9	**Inspire Super** (cyprodinil + difenoconazole)	20 fl oz	80 fl oz per year	7	0.5	No more than 2 consecutive applications. See label for greenhouse use only for cucumber.
	3 + 33	**Viathon** (tebuconazole + potassium phosphite)	4 pt	12 pt	7	0.5	–
	4 + M5	**Ridomil Gold Bravo SC** (mefenoxam + chlorothalonil)	2.5 pt	See label	0	2	No more than 4 applications per crop.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	7	**Endura** (boscalid)	6.5 oz	26 oz per year	0	0.5	No more than 1 application before alternating to another labeled fungicide with a different mode of action for at least one application.
	7	**Fontelis** (penthiopyrad)	16 fl oz	67 fl oz per year	1	0.5	No more than 2 applications sequentially.
	7 + 3	**Aprovia Top** (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz per year	0	0.5	See label for guidelines.
	7 + 3	**Luna Experience** (fluopryram + tebuconazole)	17 fl oz	34 fl oz per year	7	0.5	No more than 2 sequential applications before rotating to a non-FRAC 7, non-FRAC 3 fungicide.
	7 + 3	**Luna Flex** (fluopyram + difenoconazole)	13.6 fl oz	27.2 fl oz per year	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC 7.
	7 + 3	**Propulse** (fluopyram + prothioconazole)	13.6 fl oz	34.2 fl oz per year	7	0.5	No more than 1 soil application and 2 foliar applications per year. See label for harvesting guidelines.
	7 + 11	**Luna Sensation** (fluopryram + trifloxystrobin)	7.6 fl oz	27.1 fl oz per year	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC 7, non-FRAC 11 fungicide.
	7 + 11	**Merivon** (fluxapyroxad + pyraclostrobin)	5.5 fl oz	16.5 fl oz per year	0	0.5	No more than 1 application before alternating to a non-FRAC 7, non-FRAC 11 group fungicide. In areas where gummy stem blight resistance to FRAC 7 or 11 fungicides have been reported, tank-mix with chlorothalonil at full rate.
	7 + 11	**Pristine** **Empire** (boscalid + pyraclostrobin)	18.5 oz	74 oz per year	0	0.5	No more than 4 applications per crop and alternate chemistry.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	7 + 12	**Miravis Prime** (pydiflumetofen + fludioxonil)	11.4 fl oz	22.8 fl oz per year	1	0.5	No more than 2 applications of Miravis Prime or other Group 7 and 12 before alternation with a fungicide that is not in Group 7 or 12.
	9 + 12	**Alterity 62.5** **Switch 62.5WG** (cyprodinil + fludioxonil)	14 oz	56 oz per year	1	0.5	No more than 2 consecutive applications before switching to fungicide with a different mode of action.
	11	(azoxystrobin) **Many brands available:** Acadia 2SC, Aframe, A-Zox 25SC, Azoxy 2SC, Azoxy 2SC Prime, AzoxyStar, Azoxyzone, AZteroid FC, AZteroid FC 3.3, Heritage, Heritage SC, Mazolin, Quadris, Satori, Tetraban, Trevo	See label	See label	1	4 hr	No more than 4 applications per crop and alternate chemistry. See label for tank-mixing restrictions. Heritage and Heritage SC fungicides are only for transplants production. See label for details.
	11	**Cabrio EG** (pyraclostrobin)	16 oz	64 oz	0	0.5	See label for tank-mixing restrictions.
	11	**Evito 480 SC** **Tepera** (fluoxastrobin)	See label	See label	See label	See label	–
	11	**Narvos 50 WDG** **Sovran** (kresoxim-methyl)	4.8 oz	19.2 oz	0	0.5	Follow resistance management guidelines on label.
	11 + M5	**Arius ADV** **Quadris Opti** (azoxystrobin + chlorothalonil)	3.2 pt	See label	1	0.5	No more than 4 applications per crop for all QoI fungicides. No more than 1 consecutive application. Do not apply to mature watermelons under dry, hot, or other environmental conditions listed on label.
	11 + 3	**Quadris Top** (azoxystrobin + difenoconazole)	14 fl oz	56 fl oz per year	1	0.5	Must be rotated with a non-QoI-containing fungicide.
	11 + 3	**Topguard EQ** (azoxystrobin + flutriafol)	8 fl oz	See label	1	0.5	See label for crop-specific use.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	11 + 7	**Mural** (azoxystrobin + benzovindiflupyr)	See label	See label	0	0.5	Only for vegetable plants grown for resale to consumers.
	12	**Emblem** (fludioxonil)	7 fl oz	28 fl oz per year	1	0.5	–
	19	**Affirm WDG** **Oso 5% SC** **PH-D** (polyoxin D zinc salt)	See label	See label	0	4 hr	–
	22 + M5	**Zing!** (zoxamide + chlorothalonil)	36 fl oz	See label	0	0.5	–
	29	**Omavo** **Omega 500 F** (fluazinam)	24 fl oz	See label	7	0.5	See label for crop-specific guidelines.
Phytophthora blight/fruit and root rot	4	**Orondis Gold B** **Ridomil Gold SL** (mefonoxam)	2 pt	See label	5	2	See label for application-specific guidelines (soil-injected or soil-incorporated, soil-directed and other foliar). Suppression only.
	4 + M1	**Ridomil Gold Copper** (mefenoxam + copper hydroxide)	2 lb	8 lb	5	2	No more than 4 applications per crop.
	21	**Ranman** **Ranman 400 SC** (cyazofamid)	2.75 fl oz	16.5 fl oz	0	0.5	No more than 6 applications per crop. Follow resistance management guidelines.
	22	**Elumin** (ethaboxam)	8 fl oz	16 fl oz per year	2	0.5	Reapplications at least 14 days apart.
	22 + M3	**Gavel 75DF** (zoxamide + mancozeb)	2 lb	16 lb per year	5	2	No more than 8 applications per crop. Some cantaloupes are sensitive. See label.
	27 + 11	**Tanos** (cymoxanil + famoxadone)	10 oz	See label	3	0.5	No more than 4 applications per crop. Must tank-mix with a contact fungicide. Phytophthora blight foliar and fruit phase only (disease suppression).
	29	**Omavo** **Omega 500 F** (fluazinam)	24 fl oz	See label	7	0.5	See label for crop-specific guidelines.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	33	**Aliette 80WDG, Alude, Fosphite, K-Phite 7 LP, Linebacker WDG, ProPhyt, Reliant** (fosetyl-Al, phosphorous acid and salts)	See label	See label	See label	See label	See label for specific product guidelines.
	40	**Forum** (dimethomorph)	6 oz	30 oz	See label	0.5	No more than 5 applications per crop. Apply with another fungicide that has a different mode of action and alternate.
	40	**Orondis Ultra B** **Revus** (mandipropamid)	8 fl oz	32 fl oz	0	4 hr	Phytophthora blight suppression only.
	43	**Presidio** (fluopicolide)	4 fl oz	8 fl oz per year	2	0.5	Tank-mix with another fungicide product with a different FRAC code.
	45 + 40	**Zampro** (ametoctradin + dimethomorph)	14 fl oz	42 fl oz per year	0	0.5	No more than 2 sequential applications. Addition of a spreading/penetrating adjuvant is recommended.
	49	**Orondis Gold 200** **Orondis Opti A** **Orondis Ultra A** (oxathiapiprolin)	See label	See label	0	4 hr	Cucurbit vegetables, crop group 9. See label.
	49 + 40	**Orondis Ultra** (oxathiapiprolin + mandipropamid)	8 fl oz	32 fl oz per year	0	4 hr	No more than 2 sequential applications before rotating to a fungicide with a different mode of action. Check label for additional details.
Powdery mildew	M1	(copper compounds) **Many brands available:** AmeriCop 40 DF, Badge SC, Badge X2, Basic Copper 53, Camelot-O, Champ DP Dry Prill, Champ Formula 2 FL, ChampION++, Champ WG, Copper-Count-N, CS 2005, Cueva, Cuprofix Ultra 40 Disperss, Cuproxat, ET-F, Kentan DF, Kocide 2000, Kocide 2000-O, Kocide 3000, Kocide 3000-O, Kocide HCu, KOP-5, Kop-Hydroxide, MasterCop, Nordox 75WG, Nu-Cop 3L, Nu-Cop 30 HB, Nu-Cop 50DF, Nu-Cop 50 WP, Nu-Cop HB, Nu-Cop XLR, Previsto	See label	See label	1	Varies from 4 hr to 2 days	Check label for crop-specific guidelines.
	M1 + M2	**Top Cop w Sulfur** (copper + sulfur)	1 qt	See label	–	1	Do not apply if air temperatures greater than 90°F are expected.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	M1 + M3	**Mankocide** (copper hydroxide + mancozeb)	3 lb	24 lb	5	2	Some cantaloupe varieties are sensitive. Check label for details.
	M2	(sulfur) **Many brands available**: Acoidal, Cosavet DF, Cosavet DF Edge, Crusade DF, Defend DF, Micro Sulf, Micronized Wettable Sulfur, Suffa, Sulfur 6L, Sulfur 90W, Thiolux	See label	See label	See label	1	See individual label. Do not use when temperatures are greater than 90°F or on sulfur-sensitive varieties. Check label for use.
	M2 + 3	**Unicorn** (sulfur + tebuconazole)	3.75 lb	15 lb	14	0.5	Suppression only. Only available for use on some cucurbits. See label.
	M3 + 11	**Dexter Max** (mancozeb + azoxystrobin)	3.2 lb	12.8 lb per year	5	1	See guidelines of adjuvants and pesticides to be avoided in tank-mixing. No more than 1 application of Dexter Max or other group 11 fungicides before alternation with fungicides not in group 11.
	M5	(chlorothalonil) **Many brands available:** Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720 SC, Echo 720, Echo 90 DF, Echo ZN, Equus 720 SST, Equus DF, Initiate 720, Initiate ZN, Oranil 6L, Orondis Opti B, Praiz, Rialto 720F	See label	See label	0	1	Check label for crop-specific guidelines. Follow label recommendations on watermelon after fruit set. Do not apply to mature watermelons under dry, hot, or other environmental conditions indicated in the label.
	M5 + 27	**Ariston** **Cymbol Advance** (chlorothalonil + cymoxanil)	3 pt	17.5 pt per year	3	0.5	–
	M5 + 49	**Orondis Opti** (chlorothalonil + oxathiapiprolin)	2.5 pt	10 pt per year	0	0.5	Check label for additional guidelines. No more than 2 sequential applications before rotating to a fungicide with different mode of action.
	P1	**Actigard 50WG** (acibenzolar-S-methyl)	1 oz	8 oz	0	0.5	Apply preventatively prior to disease development. Suppression of disease.
	P4	**Vacciplant** (laminarin)	22 fl oz	See label	0	4 hr	–
	U6	**Torino** (cyflufenamid)	3.4 oz	6.8 oz per year	0	4 hr	–

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	50	**Vivando** (metrafenone)	15.4 fl oz	46.2 fl oz per year	0	0.5	See label for instructions.
	1	(thiophanate-methyl) **Many brands available:** 3336 EG, 3336 F, 3336 WP, Cercobin, Incognito 4.5F, Incognito 85WDG, Talaris 70 WSB, Thiophanate methyl 85 WDG, TM 4.5 F, T-Methyl 4.5 AG, T-Methyl 4.5 F, T-Methyl 70 WP,Topsin 4.5 FL, Topsin M WSB	See label	See label	1	1	Follow resistance management guidelines on label. This product is not recommended for powdery mildew based upon recent testing indicating that pathogen population in Florida was not sensitive to the active ingredient.
	3	**Cevya** **Provysol** (mefentrifluconazole)	5 fl oz	15 fl oz per year	0	0.5	Reapplications at least 7 days apart.
	3	**Mettle 125 ME** (tetraconazole)	8 fl oz	24 fl oz per year	1	0.5	No more than 2 sequential applications before rotating to another fungicide with alternate mode of action.
	3	**Procure 480SC** **Trionic 4 SC** (triflumizole)	8 fl oz	24 fl oz	0	0.5	Follow resistance management guidelines on label.
	3	**Proline** (prothioconazole)	5.7 fl oz	17.1 fl oz per year	7	0.5	No more than 1 soil application and 2 foliar applications per year.
	3	**Rally 40WSP** (myclobutanil)	5 oz	See label	0	1	–
	3	**Rhyme** (flutriafol)	7 fl oz	28 fl oz per year	0	0.5	No more than 2 sequential applications before rotating with a different FRAC group fungicide.
	3	(tebuconazole) **Many brands available:** Buzz Ultra DF, Incognito 4.5F, Monsoon, Onset 3.6L, Orius 3.6F, Teb 3.6 SC, Tebu 3.6F, Tebuconazole 3.6 F, Tebu-Crop 3.6F, Tebustar 3.6L, Tebuzol 3.6F, Toledo, Vibe	See label	See label	1	1	Follow resistance management guidelines indicated on the label. Check label for additional guidelines.
	3	**Topguard** (flutriafol)	14 fl oz	56 fl oz per year	0	0.5	Check label.
	3 + M5	**Muscle ADV** (tebuconazole + chlorothalonil)	2.1 pt	6.4 pt	7	0.5	Watermelon, squash, pumpkin, and melon

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	3 + 9	**Inspire Super** (cyprodinil + difenoconazole)	20 fl oz	80 fl oz per year	7	0.5	No more than 2 consecutive applications. See label for greenhouse use only for cucumber.
	3 + 33	**Viathon** (tebuconazole + potassium phosphite)	3 pt	12 pt	7	0.5	–
	7	**Endura** (boscalid)	6.5 oz	26 oz per year	0	0.5	No more than 1 application before alternating to another labeled fungicide with a different mode of action for at least 1 application.
	7	**Fontelis** (penthiopyrad)	16 fl oz	67 fl oz per year	1	0.5	No more than 2 applications sequentially.
	7	**Velum Prime** (fluopyram)	6.84 fl oz	13.7 fl oz per year	0	0.5	–
	7 + 3	**Aprovia Top** (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz per year	0	0.5	See label for guidelines.
	7 + 3	**Luna Experience** (fluopryram + tebuconazole)	17 fl oz	34 fl oz per year	7	0.5	No more than 2 sequential applications before rotating to a non-FRAC 7, non-FRAC 3 fungicide.
	7 + 3	**Luna Flex** (fluopyram + difenoconazole)	8 fl oz	27.2 fl oz per year	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC 7.
	7 + 3	**Propulse** (fluopyram + prothioconazole)	13.6 fl oz	34.2 fl oz per year	7	0.5	No more than 1 soil application and 2 foliar applications per year. See label for harvesting guidelines.
	7 + 11	**Luna Sensation** (fluopryram + trifloxystrobin)	7.6 fl oz	27.1 fl oz per year	0	0.5	No more than 2 sequential applications before rotating to a non-FRAC 7, non-FRAC 11 fungicide.
	7 + 11	**Merivon** (fluxapyroxad + pyraclostrobin)	5.5 fl oz	16.5 fl oz per year	0	0.5	No more than 1 application before alternating to a non-FRAC 7, non-FRAC 11 group fungicide. In areas where gummy stem blight resistance to FRAC 7 or 11 fungicides have been reported, tank-mix with chlorothalonil at full rate.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	7 + 11	**Pristine** **Empire** (boscalid + pyraclostrobin)	18.5 oz	74 oz per year	0	0.5	No more than 4 applications per crop and alternate chemistry.
	7 + 12	**Miravis Prime** (pydiflumetofen + fludioxonil)	11.4 fl oz	22.8 fl oz per year	1	0.5	No more than 2 applications of Miravis Prime or other Group 7 and 12 before alternation with a fungicide that is not in Group 7 or 12.
	9	**Vango** (cyprodinil)	7 oz	28 oz per year	1	0.5	Alternate to a different mode of action after 2 applications.
	9 + 12	**Alterity 62.5** **Switch 62.5WG** (cyprodinil + fludioxonil)	14 oz	56 oz per year	1	0.5	No more than 2 consecutive applications.
	11	(azoxystrobin) **Many brands available:** Acadia 2SC, Aframe, A-Zox 25SC, Azoxy 2SC, Azoxy 2SC Prime, AzoxyStar, Azoxyzone, AZteroid FC, AZteroid FC 3.3, Heritage, Heritage SC, Mazolin, Quadris, Satori, Tetraban, Trevo	See label	See label	1	4 hr	No more than 4 applications per crop and alternate chemistry. See label for tank-mixing restrictions. Heritage and Heritage SC fungicides are only for transplants production. See label for details.
	11	**Evito 480 SC** **Tepera** (fluoxastrobin)	See label	See label	See label	See label	–
	11	**Flint Extra** **Flint** (trifloxystrobin)	See label	See label	See label	0.5	For disease suppression. No more than 4 applications per crop and alternate chemistry.
	11	**Narvos 50 WDG** **Sovran** (kresoxim-methyl)	4.8 oz	19.2 oz	0	0.5	Follow resistance management guidelines on label.
	11 + M5	**Arius ADV** **Quadris Opti** (azoxystrobin + chlorothalonil)	3.2 pt	See label	1	0.5	No more than 4 applications per crop for all QoI fungicides. No more than 1 consecutive application. Do not apply to mature watermelons under dry, hot, or other environmental conditions listed on label.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	11 + 3	**Quadris Top** (azoxystrobin + difenoconazole)	14 fl oz	56 fl oz per year	1	0.5	Must be rotated with a non-QoI-containing fungicides.
	11 + 3	**Topguard EQ** (azoxystrobin + flutriafol)	8 fl oz	See label	1	0.5	See label for crop-specific use.
	11 + 7	**Mural** (azoxystrobin + benzovindiflupyr)	See label	See label	0	0.5	Only for vegetable plants grown for resale to consumers.
	12	**Emblem** (fludioxonil)	7 fl oz	28 fl oz per year	1	0.5	–
	13	**Quintec** (quinoxyfen)	6 fl oz	See label	3	0.5	No more than 4 applications. No more than 2 consecutive applications. Not labeled for all cucurbits; labeled for various melons, cantaloupe, winter squash, gourds, pumpkins, and watermelon.
	19	**Affirm WDG** **Oso 5% SC** **PH-D** (polyoxin D zinc salt)	13 fl oz	See label	0	4 hr	–
	39	**Magister SC** (fenazaquin)	36 fl oz	36 fl oz	3	0.5	Also labeled as an acaricide. Note warning to bees and insect pollinators. No more than 1 application per year.
	39	**Torac** (tolfenpyrad)	21 fl oz	42 fl oz	1	0.5	Reapplications at least 14 days apart.
	50	**Prolivo 300 SC** (pryriofenone)	5 fl oz	16 fl oz per year	0	–	No more than 2 sequential applications before rotating to another fungicide with a different mode of action.
***Pythium* spp.**	4	**Apron XL** **Orondis Gold B** **Ridomil Gold SL** **Ultra Flourish** (mefenoxam)	See label	See label	See label	See label	–

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	4	(metalaxyl) **Many brands available:** Acquire, Allegiance FL, Metalaxyl 265 ST, Metalaxyl 318 FS, Metalaxyl 4.0 ST, Metastar 2E, Metastar 4S, MetXL, Sebring 318 FS, Sebring 480 FS	See label	See label	See label	See label	–
	4 + 11	**Uniform** (mefonoxam + azoxystrobin)	See label	See label	See label	0	Apply 0.34 fl oz/1000 ft of row as in-furrow spray in a minimum of 5 gal of water/A at planting. No more than 1 application per season.
	28	**Previcur Flex** **Promess** (propamocarb hydrochloride)	1.2 pt	6 pt	2	0.5	Use a tank-mix partner. See label for directions using a contact fungicide and Pythium suppression.
Target spot (*Corynespora cassicola*)	M3 + 11	**Dexter Max** (mancozeb + azoxystrobin)	3.2 lb	12.8 lb per year	5	1	See guidelines of adjuvants and pesticides to be avoided in tank-mixing. No more than 1 application of Dexter Max or other group 11 fungicides before alternation with fungicides not in group 11.
	M5	(chlorothalonil) **Many brands available:** Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720 SC, Echo 720, Echo 90 DF, Echo ZN, Equus 720 SST, Equus DF, Initiate 720, Initiate ZN, Orondis Opti B, Periapt, Praiz	See label	See label	0	1	Check label for crop-specific guidelines. Follow label recommendations on watermelon after fruit set. Do not apply to mature watermelons under dry, hot, or other environmental conditions indicated in the label.
	M5 + 27	**Ariston** **Cymbol Advance** (chlorothalonil + cymoxanil)	3 pt	17.5 pt per year	3	0.5	–
	M5 + 49	**Orondis Opti** (chlorothalonil + oxathiapiprolin)	2.5 pt	10 pt per year	0	0.5	Check label for additional guidelines. No more than 2 sequential applications before rotating to a fungicide with different mode of action.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	1	(thiophanate-methyl) **Many brands available:** 3336 EG, 3336 F, 3336 WP, Cercobin, Incognito 4.5F, Incognito 85WDG, Talaris 70 WSB, Thiophanate methyl 85 WDG, TM 4.5 F, T-Methyl 4.5 AG, T-Methyl 4.5 F, T-Methyl 70 WP, Topsin 4.5 FL, Topsin M WSB	See label	See label	1	1	Follow resistance management guidelines on label.
	3	**Mettle 125 ME** (tetraconazole)	8 fl oz	24 fl oz per year	1	0.5	No more than 2 sequential applications before rotating to another fungicide with alternate mode of action.
	3	**Rhyme** (flutriafol)	7 fl oz	28 fl oz per year	0	0.5	No more than 2 sequential applications before rotating with a different FRAC group fungicide.
	3	**Topguard** (flutriafol)	14 fl oz	56 fl oz per year	0	0.5	Check label.
	7 + 3	**Aprovia Top** (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz per year	0	0.5	See label for guidelines.
	7 + 11	**Merivon** (fluxapyroxad + pyraclostrobin)	5.5 fl oz	16.5 fl oz per year	0	0.5	See label.
	7 + 12	**Miravis Prime** (pydiflumetofen + fludioxonil)	11.4 fl oz	22.8 fl oz per year	1	0.5	No more than 2 applications of Miravis Prime or other Group 7 and 12 fungicides before alternation with a fungicide that is not in Group 7 or 12.
	11	(azoxystrobin) **Many brands available:** Acadia 2SC, Aframe, A-Zox 25SC, Azoxy 2SC, Azoxy 2SC Prime, AzoxyStar, Azoxyzone, AZteroid FC, Azteroid FC 3.3, Equation, Equation SC, Mazolin, Quadris, Satori, Tetraban, Trevo	See label	See label	1	4 hr	No more than 4 applications per crop and alternate chemistry. See label for tank-mixing restrictions.
	11	**Cabrio EG** (pyraclostrobin)	16 oz	64 oz	0	0.5	See label for tank-mixing restrictions.
	11	**Evito 480 SC** **Tepera** (fluoxastrobin)	See label	See label	See label	See label	–
	11 + 3	**Topguard EQ** (azoxystrobin + flutriafol)	8 fl oz	See label	1	0.5	See label for crop-specific use.
	19	**Affirm WDG** **Oso 5% SC** **PH-D** (polyoxin D zinc salt)	See label	See label	0	4 hr	–

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	22 + M5	**Zing!** (zoxamide + chlorothalonil)	36 fl oz	See label	0	0.5	–
Scab (*Cladosporium cucemerinum*)	M1	**Cueva** **Camelot O** **Grotto** (copper octanoate)	See label	See label	0	4	See label for crops listed.
	M1 + M3	**Mankocide** (copper hydroxide + mancozeb)	3 lb	24 lb	5	2	Some cantaloupe varieties are sensitive. Check label for details.
	M3	(mancozeb) **Many brands available:** Dithane DF Rainshield, Dithane F45 Rainshield, Dithane M45, Fortuna 75WDG, Koverall, Manzate Max, Manzate Pro-Stick, Penncozeb 75DF, Penncozeb 80WP, Protect DF, Roper DF Rainshield	See label	See label	5	1	Check label for crop-specific guidelines.
	M3 + 11	**Dexter Max** (mancozeb + azoxystrobin)	3.2 lb	12.8 lb per year	5	1	See guidelines of adjuvants and pesticides to be avoided in tank-mixing. No more than 1 application of Dexter Max or other group 11 fungicides before alternation with fungicides not in group 11.
	M5	(chlorothalonil) **Many brands available:** Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720 SC, Echo 720, Echo 90 DF, Echo ZN, Equus 720 SST, Equus DF, Initiate 720, Initiate ZN, Oranil 6L, Orondis Opti B, Periapt, Praiz, Rialto 720 F	See label	See label	0	1	Check label for crop-specific guidelines. Follow label recommendations on watermelon after fruit set. Do not apply to mature watermelons under dry, hot, or other environmental conditions indicated in the label.
	M5 + 27	**Ariston** **Cymbol Advance** (chlorothalonil + cymoxanil)	3 pt	17.5 pt per year	3	0.5	–
	M5 + 49	**Orondis Opti** (chlorothalonil + oxathiapiprolin)	2.5 pt	10 pt per year	0	0.5	Check label for additional guidelines. No more than 2 sequential applications before rotating to a fungicide with different mode of action.
	P1	**Actigard 50WG** (acibenzolar-S-methyl)	1 oz	8 oz	0	0.5	Apply preventatively prior to disease development. Suppression of disease.

Pertinent Diseases or Pathogens	Fungicide Group[1]	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks[2]
			Appl.	Season	Harvest	Reentry	
	4 + M5	**Ridomil Gold Bravo SC** (mefenoxam + chlorothalonil)	3.25 pt	See label	0	2	No more than 4 applications per crop.
	7 + 3	**Aprovia Top** (benzovindiflupyr + difenoconazole)	13.5 fl oz	53.6 fl oz per year	0	0.5	See label for guidelines.
	7 + 12	**Miravis Prime** (pydiflumetofen + fludioxonil)	11.4 fl oz	22.8 fl oz per year	1	0.5	No more than 2 applications of Miravis Prime or other Group 7 and 12 before alternation with a fungicide that is not in Group 7 or 12.
	19	**Affirm WDG** **Oso 5% SC** **PH-D** (polyoxin D zinc salt)	See label	See label	0	4 hr	–
Fusarium wilt (watermelon)	3	**Proline 480 SC** (prothioconazole)	5.7 fl oz	17.1 fl oz per year	7	0.5	No more than 1 soil application and 2 foliar applications per year.
	7 + 3	**Propulse** (fluopyram + prothioconazole)	13.6 fl oz	34.2 fl oz per year	7	0.5	No more than 1 soil application and 2 foliar applications per year. See label for harvesting guidelines.
	7+12	**Miravis Prime** (pydiflumetofen + fludioxonil)	11.4 fl oz	22.8 fl oz per year	1	0.5	For suppression only. Follow specific guidelines in the label.

[1] FRAC code (fungicide group): Number (1–54) and letters U, P, NC, BM and M 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. Source: FRAC Code List 2024; http://www.frac.info/ (FRAC = Fungicide Resistance Action Committee).

[2] 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 14. Nonfumigant nematicides for cucurbit crops in Florida. Contact: Johan Desaeger, UF/IFAS Gulf Coast Research and Education Center.

Product	Application Directions
Mocap 15G (a.i. ethoprop) (only labeled on cucumber)	Apply 13 lb/A (7-ft row spacing) or 2.1 lb/1,000 linear ft of row in a band 12–15 inches wide on the row at planting. Prepare bed and knock off top to provide a level area for treatment. Mix with the top 2–4 inches of soil with mechanical equipment right after application. DO NOT use as a seed furrow treatment or allow granules to contact the seed. No more than 1 application per season.
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 2 gal/A per season. Reapplications at least 7 days apart unless a longer interval is stated. If an at-plant application of more than ½ gal/A is made, do not make more than 2 additional applications.
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. Soil reapplications at least 5 days apart. No more than 13.7 fl oz/A of Velum (0.446 lb/A fluopyram) per year, regardless of formulation (Velum and/or Luna) or method of application (soil or foliar). For soil application, to limit the potential for development of disease resistance to this chemical class, the first foliar fungicide application after Velum should be a product from a different FRAC group.
Salibro (a.i. fluazaindolizine)	Apply 15.3–23 fl oz/A (0.5–0.75 lb/A ai) as preplant incorporated, preplant drip, or at-plant drip. Apply 7.7 fl oz/A (0.25 lb ai) for in-season drip chemigations. No more than 23 fl oz/A per calendar year. No more than 2 applications per calendar year. Reentry interval is 12 hr. Reapplications at least 28 days apart. Pre-harvest interval: Do not apply within 1 day of harvest.
Biological nematicides	See chapter 19.
Mocap and Vydate are insecticide/nematicides; Velum is a fungicide/nematicide; Nimitz is a true nematicide. Unlike fumigants, these products are not volatile and will move through the soil via water; depending on the water solubility, these products will have different recommendations as far as how to best apply them (see specific label recommendations); when nematode pressure is high, they may not be as consistently effective against root nematodes as the fumigants.	

Table 15. Fumigant nematicides for cucurbit crops in Florida. Contact: Johan Desaeger, UF/IFAS Gulf Coast Research and Education Center.

Nematicide	Broadcast Application[1]		In-the-Row Applications
	Gallons or lb/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	31.8–50.2	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.
Pic-Clor 60	19–31.5	57–90	For any row spacing, application rates should never exceed the labeled maximum for broadcast applications. Consult the product label for additional detail.
Vapam HL	75	–	For drip or in-row chisel fumigation, consult product label for proportionately reduced overall rates, drip concentration, and flow-modifying directions and procedures.
KPam HL	60	–	For drip or in-row chisel fumigation, 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 other flow-modifying directions.

[1] Gallons/acre and fl oz/1000 feet provided only for mineral soils. Higher rates may be possible for heavier-textured (loam, silt, clay) or highly organic soils.
[2] All of the fumigants mentioned are for retail sale and use only by state-certified applicators or persons under their direct supervision. New supplemental labeling for the Telone products must be in the hands of the user at the time of application. See new label details for additional use restrictions based on soil characteristics, buffer zones, requirements for Fumigant Management Plans (FMP) and personal protective equipment (PPE), mandatory good agricultural practices (GAPs), product and applicator training certification, and other rate-modifying recommendations with use of highly retentive mulch films.
[3] Higher application rates are possible in the presence of cyst-forming nematodes.
Rates are believed to be correct for products named and similar products of other brand names, when applied to mineral soils. Higher rates are required for muck (organic) soils. However, the **grower** has the final responsibility to see that each product is used legally; **read the label** of the product to be sure that you are using it properly.