

Chapter 10. Minor Vegetable Crop Production

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Information regarding crop specific fertilization and irrigation recommendations can be found in chapters 2 and 3, respectively.

Celery, Okra, and Parsley Botany and Planting

Celery - *Apium graveolens*, Apiaceae (Umbelliferae)

Okra – *Abelmoschus esculentus*, Malvaceae

Parsley - *Petroselinum crispum*, Apiaceae (Umbelliferae)

Table 10.1. Planting information for celery, okra, parsley.

	Celery	Okra	Parsley
North Florida	Aug - Feb	Mar - Jun	Sept - Mar
Central Florida	Sept - Mar	Feb - Aug	Sept - Mar
South Florida	Oct - Mar	Jan – Mar/ Aug - Oct	All year
Distance between rows (in)	18-40	36 - 60	6 - 12
Distance between plants (in)	6-12	4 - 10	drilled
Seeding depth (in)	on surface	0.5 - 1.0	0.25
Seed per acre (lb)	1 - 2	6 - 81	6 - 8
Days to maturity from seed	75 - 90	60 - 70	70 - 80
Plant population (acre)	58,080	43,560	1 million+

Table 10.3. Herbicides approved for managing weeds in celery.

Labels change frequently. Be sure to read a current product label before applying any chemical.			
Active ingredient lb. a.i./A	Trade name product/A	MOA code	Weeds controlled / remarks
*** PREPLANT / PREEMERGENCE ***			
Bensulide 5.0 - 6.0	(Prefar) 4 E 5 - 5 qt.	8	Broadleaf and grass weeds. Incorporate mechanically 1 - 2 in. deep or with irrigation 2 - 4 in. deep.
Carfentrazone up to 0.031	(Aim) 1.9 EW up to 2 fl. oz. (Aim) 2.0 EC up to 2 fl. oz.	14	Apply as a preplant burn down for emerged broadleaf weeds. Use crop oil concentrate, methylated seed oil, or nonionic surfactant at recommended rates. Maximum rate of 0.096 lb. a.i./A per season. No pretransplant interval.
Glyphosate	(various formulations) consult labels	9	Emerged broadleaf and grass weeds. Apply as a preplant burn down. Consult label for individual product directions.
Pelargonic acid	(Scythe) 4.2 EC 3 - 10% v/v	27	Emerged broadleaf and grass weeds. Apply as a preplant burn down treatment. Scythe is a contact and nonresidual and can be tank mixed residual preemergence herbicides to lengthen control.
Prometryn 1.0 - 2.0	(Caparol) 4 L 2 - 4 pt.	5	Most annual broadleaf and grass weeds. Do not exceed one application. Consult label for rotational crop restrictions.
Pyraflufen ethyl 0.0008 - 0.003	(ET Herbicide/Defoliant) 0.5 - 2.0 fl. oz.	14	Broadleaf and grass weeds. Burndown preplant application 1 day before planting. Include a NIS or COC in the spray solution.
S-metolachlor 0.95 - 1.26	(Dual Magnum) 1.0 - 1.33 pt.	15	Broadleaf, grass weeds and nutsedge. Label is a third party registration (TPR, Inc.) and authorization and waiver agreements must be obtained prior to use. Rates are based on organic matter.

Cultivars

Table 10.2. Common cultivars of celery, okra, and parsley.

Celery	Okra	Parsley
Floribelle - M9	Annie Oakley II (H ¹) Millionaire (H)	Forest Green (CL ¹)
June Belle	Cajun Delight (H) North and South (H)	Jade (CL, H)
Florida 683	Clemson Spineless Spike (H)	Improved Market Gardeners (CL)
	Clemson Spineless 80	Dark Green Italian (PL)

¹ H=hybrid, CL=curley leaf, PL=plain leaf

Table 10.3. Herbicides approved for managing weeds in celery. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical.			
Active ingredient lb. a.i./A	Trade name product/A	MOA code	Weeds controlled / remarks
Trifluralin 0.5	(Treflan, Trifluralin) 4 EC 1 pt. (Treflan, Trifluralin) 10 G 5 lb.	3	Annual broadleaf and grass weeds. Do not apply to muck soils. Mineral soils with 2 - 5% organic material, apply 0.75 lb. a.i./A. Incorporate 4 in. or less with 8 hr. of application.
*** POSTTRANSPLANT / POSTEMERGENCE ***			
Carfentrazone up to 0.031	(Aim) 1.9 EW up to 2 fl. oz. (Aim) 2.0 EC up to 2 fl. oz.	14	Emerged broadleaf weeds. apply as hooded application to row middles only. Use crop oil concentrate or nonionic surfactant at recommended rates. May be tank mixed with other herbicides. Do not exceed 6.1 fl. oz. per cropping season. PHI 0 days.
Clethodim 0.09 - 0.13 0.07 - 0.13	(Select, Arrow) 2 EC 6 - 8 fl. oz. (Select Max) 1 EC 9 - 16 fl. oz.	1	Perennial and annual grass weeds. In fields with heavy grass pressure or larger grass weeds, use higher rates or repeat applications 14 days apart. Use a crop oil concentrate at 1% v/v in the finished spray volume. Nonionic surfactant with Select Max. PHI 30 days.
Linuron 0.5 - 1.0	(Lorox DF) 50 DF 1 - 2 lb.	7	Broadleaf and grass weeds. Apply after transplanting but before celery is 8 in. tall. Do not apply when temperatures exceed 85F nor as a tank mix with surfactants, nitrogen, or fertilizer solution. PHI 45 days.
Pelargonic acid	(Scythe) 4.2 EC 3 - 10% v/v	27	Emerged broadleaf and grass weeds. Direct spray to row middles with hooded or shielded sprayer. Product is a contact, nonselective herbicide with no residual control. May be tank mixed with several soil residual compounds.
Prometryn 0.8 - 1.6	(Caparol) 4 L 1.6 - 3.2 pt.	5	Broadleaf weeds. Apply one application during the 2 to 6 wk. period after transplanting. Weeds should not exceed 2 in.
S-metolachlor 0.95 - 1.26	(Dual Magnum) 1.0 - 1.33 pt.	15	Broadleaf, grass weeds and nutsedge. Label is a third party registration (TPR, Inc.) and authorization and waiver agreements must be obtained prior to use. Rates are based on organic matter
Sethoxydim 0.28	(Poast) 1.5 EC 1.5 pt.	1	Emerged grass weeds. A maximum of 3 pt./A per season. Include a crop oil concentrate. Unsatisfactory results may occur if applied to grasses under stress. PHI 30 days.
*** CELERY SEEDBEDS ***			
Prometryn 0.6 - 0.8	(Caparol) 4 L 1.2 - 1.6 pt.	5	Broadleaf weeds. Apply once per year to seedbeds. Apply after celery has 2-5 true leaves. Apply after seedbed covers have been removed for at least one week.

Table 10.4. Herbicides approved for managing weeds in okra.

Labels change frequently. Be sure to read a current product label before applying any chemical.			
Active ingredient lb. a.i./A	Trade name product/A	MOA code	Weeds controlled / remarks
*** PREEMERGENCE ***			
Carfentrazone up to 0.031	(Aim) 1.9 EW up to 2 fl. oz. (Aim) 2 EC up to 2 fl. oz.	14	Apply as a preplant burn down for emerged broadleaf weeds. Use crop oil concentrate, methylated seed oil, or nonionic surfactant at recommended rates. Maximum rate of 0.096 lb. a.i./A per season. No pretransplant interval.
Flumioxazin up to 0.128	(Chateau) 51 WDG up to 4 oz.	14	Annual broadleaf weeds. Apply to row middles of raised plastic mulched beds that are at least 4 in. higher than the treated row middle and 24 in. bed width. Label is a Third-Party Registration (TPR, Inc.). Use without a signed authorization is a waiver of liability is a misuse of the product. Tank mix with a burn down herbicide to control emerged weeds. 0 day pretransplant interval.
Glyphosate	(various formulations) consult labels	9	Emerged broadleaf and grass weed control. Apply as a preplant burn down for emerged weeds. Read label for individual product directions.
Lactofen 0.25 - 0.5	(Cobra) 2 EC 16 - 32 fl. oz.	14	Broadleaf weeds. Apply to row middles only with a shielded or hooded sprayer. A minimum of 24 fl. oz./A is required for residual control. Add a crop oil concentrate or nonionic surfactant for control emerged weeds. Registration is through Third Party Registrations, Inc. (TPR, Inc.) and a copy of the label must be on-hand at time of application. PHI 30 days.

Table 10.4. Herbicides approved for managing weeds in okra. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical.			
Active ingredient lb. a.i./A	Trade name product/A	MOA code	Weeds controlled / remarks
Mesotrione 0.19	(Callisto) 4 L 6 fl. oz.	28	Broadleaf and grass weeds. Apply to row middles only. Leave one foot untreated area or 6" on either side of the plant row. Injury risk is greatest on coarse textured soils (sand, sandy loam, or loamy sand). Apply as one preemergence application OR one postemergence application. Callisto will cause whitening of the okra leaves.
Paraquat 0.5 - 1.0	(Gramoxone) 2 SL 2.0 - 4.0 pt.	22	Emerged broadleaf and grass weed control. Apply one application before crop emergence. Do not exceed 8 pt./A per season.
Pelargonic acid	(Scythe) 4.2 EC 3 - 10% v/v	27	Broadleaf and grass weeds. Scythe is a contact, nonselective herbicide with no residual activity. May be tank mixed with trifluralin for soil residual activity. Consult label for rates and other information.
Prometryn 0.75 - 1.5	(Caparol) 4 L 1.5 - 3.0 pt.	5	Apply after planting, but before crop emergence. Apply as one PRE application at 3 pt. Or 1 PRE application at 1.5 pt. followed by one POST-directed application at 1.5 pt. Do not exceed 3 pt./A per crop cycle.
Trifluralin 0.5 - 0.75	(Treflan, Trifluralin) 4 EC 0.5 - 1.5 pt. (Treflan, Trifluralin) 10 G 5.0 - 7.5 lb.	3	Annual broadleaf and grass weeds. Incorporate 4 in. or less within 8 hr. Results in Florida are erratic on soils with low organic matter and clay contents. Note precautions against planting non-registered crops within 5 months.
*** POSTEMERGENCE ***			
Carfentrazone up to 0.031	(Aim) 1.9 EW up to 2 fl. oz. (Aim) 2 EC up to 2 fl. oz.	14	Emerged broadleaf weeds. Apply to row middles only with a hooded sprayer. Maximum rate of 0.096 lb. a.i./A per season. Rates apply to mineral and muck soils. Use crop oil concentrate or nonionic surfactant at recommended rates. PHI 0 days.
Glyphosate	(various formulations) consult labels	9	Emerged broadleaf and grass weeds. Apply to row middles only with a hooded sprayer. PHI 14 days.
Halosulfuron 0.024 - 0.05	(Sanda) 75 WG 0.5 - 1.0 oz.	2	Broadleaf and purple/yellow nutsedge weeds. Apply to row middles of direct-seeded or transplanted okra. If plastic is used, prevent herbicide contact with the plastic. Do not apply more than 2 oz./A per 12-month period. PHI 30 days.
Lactofen 0.25 - 0.5	(Cobra) 2 EC 16 - 32 fl. oz.	14	Broadleaf weeds. Apply to row middles only with a shielded or hooded sprayer. A minimum of 24 f. oz./A is required for residual control. Add a crop oil concentrate or nonionic surfactant for control of emerged weeds. One POST application may be made per growing season at 18 days after transplanting. Cobra contacting green foliage or fruit can cause excessive injury. Registration is through Third Party Registration, Inc. and a copy of the label must be on hand at time of application. PHI 30 days.
Mesotrione 0.09	(Callisto) 4 L 3 fl. oz.	28	Broadleaf and grass weeds. Direct spray with hooded sprayer to minimize contact with okra plants. Okra must be at least 3 in. tall. Use of a nonionic surfactant is required. Injury risk is greatest on coarse textured soils. Apply as one preemergence or one postemergence application. PHI 28 days.
Paraquat 0.5 - 1.0	(Gramoxone) 2 SL 2.0 pt.	22	Emerged broadleaf and grass weeds. Apply to row middles only and do not allow contact to okra plants. Limit of 2 applications after crop emergence. Do not exceed 8 pt./A pre-season. PHI 60 days.
Pelargonic acid	(Scythe) 4.2 EC 3 - 10% v/v	27	Broadleaf and grass weeds. Apply to row middles only with a shielded sprayer.
Prometryn 0.75	(Caparol) 4 L 1.5 pt.	5	Apply 1 postemergence application directed to the base of the crop. If a PRE application was made do not exceed 3 pt./A. PHI 14 days.
Sethoxydim 0.19 - 0.28	(Poast) 1.5 EC 1.0 - 1.5 pt.	1	Grass weeds. Efficacy will be decreased if grass weeds are under stress. Include a crop oil concentrate or methylated seed oil in the spray. PHI 14 days.

Table 10.5. Herbicides approved for managing weeds in parsley.

Labels change frequently. Be sure to read a current product label before applying any chemical.					
Active ingredient lb. a.i./A	Trade name product/A	MOA code	Crops	Weeds controlled / remarks	
*** PREEMERGENCE ***					
Bensulide 5.0 - 6.0	(Prefar) 4 E 5 - 6 qt.	8	Parsley	Annual broadleaf and grass weeds. Incorporate or irrigate 1-2 in. deep within 36 hr. of application. Consult label for rotation restrictions.	
Carfentrazone up to 0.031	(Aim) 1.9 EW up to 2 fl. oz. (Aim) 2.0 EC up to 2 fl. oz.	14	Parsley, cilantro	Apply as a preplant burn down for emerged broadleaf weeds. Use crop oil concentrate, methylated seed oil, or nonionic surfactant at recommended rates. Maximum rate of 0.096 lb. a.i./A per season. No pretransplant interval.	
Glyphosate	(various formulations) consult label	9	Parsley, cilantro	Control emerged broadleaf and grass weeds. Consult individual labels for restrictions.	
Linuron 0.5 - 1.5	(Lorox DF) 50 DF 1 - 3 lb.	7	Parsley, cilantro	Mineral and muck soils. Apply after planting and before crop emergence. Use lower rates on coarse soils.	
Pelargonic acid	(Scythe) 4.2 EC 3 - 10% v/v	27	Parsley, cilantro	Controls emerged weeds. Apply before emergence of crop. Product is a contact, nonselective, foliar applied herbicide. There is no residual activity.	
Prometryn 1.0 - 1.6	(Caparol) 4 L 1.0 pt.	5	Parsley, cilantro	A single preemergence application can be applied up to 14 days after planting. A second application can be made up to 30 days prior to harvest. Do not apply on sand or loamy sand. Read label for rotation restrictions.	
Pyraflufen 0.001 - 0.003	(ET Herbicide/Defoliant) 0.5 - 2.0 fl. oz.	14	Parsley	Emerged broadleaf and grass weeds. Plant 1 day after application. Apply as a preplant burndown treatment.	
*** POSTEMERGENCE ***					
Carfentrazone up to 0.031	(Aim) 1.9 EW up to 2 fl. oz. (Aim) 2.0 EC up to 2 fl. oz.	14	Parsley, cilantro	Emerged broadleaf control. Post-direct hooded application to row middles. Read the label for adjuvant requirements. PHI 0 days.	
Clethodim 0.10 - 0.13	(Arrow, Select) 2 EC 6 - 8 fl. oz. (Select Max) 1 EC	1	Parsley, cilantro	Annual and perennial grass control. Read the label for required adjuvants.	
0.07 - 0.13	9 - 16 fl. oz.				
Linuron 0.5	(Lorox DF) 50 DF 1 lb.	7	Parsley, cilantro	Apply after the crop has a minimum of 3 true leaves or crop injury may result. Apply when weeds are in the 1 to 3 true leaf stage. Do not exceed 3 lb. of Lorox per acre per season. PHI 30 days.	
Prometryn 0.5	(Caparol) 4 L 1.0 pt.	5	Parsley, cilantro	An application can be made up to 30 days prior to harvest. Another application can be applied after harvest to the new regrowth. Do not use on sand or loamy sands. Read label for rotation restrictions.	
Sethoxydim 0.19 - 0.28	(Poast) 1.5 EC 1.0 - 1.5 pt.	1	Parsley, cilantro	Growing grass weeds. Decreased efficacy if weeds are under stress. Do not exceed 3.0 pt./A per season. Include a COC in the spray solution. PHI 15 days.	

Table 10.6. Insecticides approved for managing insect pests of celery.

Labels change frequently. Be sure to read a current product label before applying any chemical.						
Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.						
Trade Name Active Ingredient	Rate Product/acre	REI hours	Days to Harvest	Insects	MOA Code ¹	Notes ²
Actara (thiamethoxam)	1.5-5.5 oz	12	7	aphids, flea beetles, leafhoppers, whiteflies	4A	Do not use if other 4A insecticides have been or will be used.
Admire Pro (imidacloprid)	4.4-10.5 fl oz	12	45	aphids, leafhoppers, whiteflies, foliage feeding thrips	4A	Do not apply more than 0.38 lb ai (10.5 fl oz product) per acre per year.
Agree WG (<i>Bacillus thuringiensis</i> subspecies <i>alzawai</i>)	0.5-2.0 lb	4	0	lepidopteran larvae (caterpillar pests)	11A	Apply when larvae are small for best control. OMRI-listed ² .
*Agri-Mek SC (abamectin)	1.75-3.5 fl oz	12	7	<i>Liriomyza</i> leafminers, spider mites	6	No more than 2 sequential applications. Must be used with an adjuvant (but not binder sticker types). Not for use on leafy vegetables grown for transplant.
*Ambush 25W (permethrin)	6.4-12.8 oz	12	1	beet armyworm, cabbage looper, corn earworm, cutworms, fall armyworm, leafminers	3A	Do not apply more than 128 oz/acre per season.
Assail 30SG (acetamiprid)	2.0-4.0 oz	12	7	aphids, whiteflies	4A	Begin applications for whiteflies when first adults are noticed. Do not apply more than 5 times per season or apply more often than every 7 days.
Avaunt (indoxacarb)	3.5 oz	12	3	beet armyworm, cabbage looper,	22	Do not apply more than 14 ounces of product per acre per crop.
Aza-Direct (azadirachtin)	1-2 pt, up to 3.5 pt	4	0	aphids, beetles, caterpillars, leafhoppers, leafminers, thrips, weevils, whiteflies	un	Antifeedant, repellent, insect growth regulator. OMRI-listed ² .
Azatin XL (azadirachtin)	5-21 fl oz	4	0	aphids, beetles, caterpillars, leafhoppers, leafminers, thrips, weevils, whiteflies	un	Antifeedant, repellent, insect growth regulator.
*Baythroid XL (beta-cyfluthrin)	0.8-3.2 fl oz	12	0	beet and southern armyworm (1 st and 2 nd instars), cabbage looper, corn earworm, cutworms, flea beetles, grasshoppers, potato leafhopper, saltmarsh caterpillar, thrips, vegetable weevil, yellowstriped armyworm, suppression of adult whitefly	3A	Maximum of 12.8 fl oz per acre per season.
Belay Insecticide (clothianidin)	3-4 fl oz	12	7	aphids, flea beetles, leafhoppers, whiteflies (suppression)	4A	Regardless of application method, do not apply more than 0.2 lb ai/acre per year (12 fl oz). Do not apply at intervals of less than 10 days. Highly toxic to bees--do not allow drift to flowering weeds or nearby crops in bloom.
Belay Insecticide (clothianidin)	9-12 fl oz (soil application)	12	21	aphids, flea beetles, leafhoppers, leafminers (suppression), earwigs, crickets, grasshoppers, whiteflies (suppression)	4A	See label for application methods. Regardless of application method, do not apply more than 0.2 lb ai/acre per year (12 fl oz).
Belay 50 WDG (clothianidin)	1.6-2.1 oz	12	7	aphids, flea beetles, suppression of leafminers and whiteflies	4A	Do not apply more than 6.4 oz per acre per season. Do not use an adjuvant. Toxic to bees. Do not allow drift to flowering weeds or nearby crops in bloom.
Belay 50 WDG (clothianidin)	4.8 -6.4 oz (soil application)	12	Apply at planting	aphids, flea beetles, leafhoppers, leafminers (suppression), whiteflies (suppression)	4A	Do not apply more than 6.4 oz per acre per season. See label for application instructions.
Beleaf 50 SG (flonicamid)	2.0-2.8 oz	12	0	aphids, plant bugs	9C	Do not apply more than 8.4 oz/acre per season. Begin applications before pests reach damaging levels.
Belt SC (flubendiamide)	1.5 fl oz	12	1	armyworms, corn earworm, green cloverworm, loopers, saltmarsh caterpillar, tobacco budworm	28	Do not apply more than 4.5 fl oz/acre per season.
Biobit HP (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.5-2.0 lb	4	0	caterpillars (will not control large armyworms)	11A	Treat when larvae are young. Good coverage is essential. Can be used in the greenhouse. OMRI-listed ² .
BotaniGard ES (<i>Beauveria bassiana</i>)	0.5-2 qt/100 gal	4	0	aphids, thrips, whiteflies	--	May be used in greenhouses. Contact dealer for recommendations if an adjuvant must be used. Not compatible in tank mix with most fungicides.

Table 10.6. Insecticides approved for managing insect pests of celery. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.						
Trade Name Active Ingredient	Rate Product/acre	REI hours	Days to Harvest	Insects	MOA Code ¹	Notes ²
Closer SC (sulfoxaflor)	1.5-5.75 fl oz	12	3	aphids, silverleaf or sweetpotato whitefly	4C	Do not make more than 2 consecutive or 4 total applications per crop.
Coragen (rynaxypyr)	3.5-7.5 fl oz	4	1	beet armyworm, cabbage looper, corn earworm, leafminers, suppression of whitefly nymphs	28	May be applied via drip chemigation in addition to foliar and various soil application methods.
Courier 40SC (buprofezin)	9.0-13.6 fl oz	12	7	leafhoppers, planthoppers, whiteflies	16	Do not make more than 2 applications per crop cycle. IGR targets immatures.
Crymax WDG (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.5-2.0 lb	4	0	caterpillars	11A	Use high rate for armyworms. Treat when larvae are young.
Deliver (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.25-1.5 lb	4	0	caterpillars	11A	Use higher rates for armyworms. OMRI-listed ² .
Dimethoate 4EC (dimethoate)	1 pt	48	7	leafminers	1B	Do not apply more than 3 pt per acre per year.
DiPel DF (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.5-2.0 lb	4	0	caterpillars	11A	Treat when larvae are young. Good coverage is essential. See label for rates for specific pests. For organic production.
Durivo (thiamethoxam, chlorantraniliprole)	10.0-13.0 fl oz	12	30	aphids, beet armyworm, cabbage looper, corn earworm, fall armyworm, flea beetles, leafhoppers, whiteflies	4A, 28	Do not exceed more than 13 fl oz per acre per season.
Entrust SC (spinosad)	1.5-10.0 fl oz	4	1	armyworms, cabbage looper, leafminers, thrips	5	See label for resistance management recommendations. Apply no more than 29 oz per acre per year. OMRI-listed ² .
Exirel (cyazypyr)	7.0-20.5 fl oz	12	1	beet armyworm, cabbage looper, corn earworm, cutworms, diamondback moth, fall armyworm, green peach aphid, leafminers, whitefly	28	Do not apply more than 0.4 lb ai of cyazypyr or cyantraniliprole-containing products (such as Verimark) per crop whether applications are made to soil or foliage.
Extinguish (S)-methoprene)	1-1.5 lb	4	0	fire ants	7A	Slow-acting IGR (insect growth regulator). Best applied early spring and fall where crop will be grown. Colonies will be reduced after three weeks and eliminated after 8 to 10 weeks. May be applied by ground equipment or aerially.
Grandevo <i>Chromobacterium</i> <i>subtsugae</i> strain PRAA4-1	1-3 lb	4	0	aphids, armyworm, cabbage looper, cutworms, diamondback moth, green cloverworm, mites, tobacco budworm, thrips, whiteflies	—	Can be used in organic production. OMRI-listed ² .
Fulfill (pymetrozine)	2.75 oz	12	7	aphids, suppression of whiteflies	9B	Apply when aphids first appear, before populations build to damaging levels. Two applications (maximum allowed) may be needed to control persistent aphid populations.
Intrepid 2F (methoxyfenozide)	4-10 fl oz	4	1	armyworms, cabbage looper, webworms	18	Do not apply more than 64 fl oz per acre per season.
Javelin WG (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.12-1.5 lb	4	0	most caterpillars, but not Spodoptera species (armyworms)	11A	Treat when larvae are young. Thorough coverage is essential. OMRI-listed ² .
*Lannate LV, *SP (methomyl)	LV: 0.75-3 pt SP: 0.25-1.0 lb	48	7	armyworms, aster leafhopper, beet armyworm, loopers, variegated cutworm	1A	Do not apply more than 24 pt of LV or 8 lb SP per acre per season.
*Larvin 3.2 (thiodicarb)	16-30 fl oz	48	14	armyworms, beet armyworm, cabbage looper, corn earworm, fall armyworm, southern armyworm	1A	Do not exceed 60 fluid ounces of Larvin per acre per season.
Malthion 5EC (malathion)	2.4 pt	24	7	aphids, spider mites	1B	Maximum number of applications per year is two and minimum retreatment interval is 7 days.
Malathion 8F (malathion)	1-1.5 pt	24	7	aphids, spider mites	1B	Do not apply more than twice per year.

Table 10.6. Insecticides approved for managing insect pests of celery. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.

Trade Name Active Ingredient	Rate Product/acre	REI hours	Days to Harvest	Insects	MOA Code ¹	Notes ²
Movento (spirotriamat)	4.0-5.0 fl oz	24	3	aphids, whiteflies	23	Do not apply more than 10 fl oz/acre/crop.
M-Pede 49% EC (Soap, insecticidal)	1-2% V/V	12	0	whiteflies	--	OMRI-listed ² .
*Mustang (zeta-cypermethrin)	2.4-4.3 fl oz	12	1	corn earworm, cucumber beetles, cutworms, flea beetles, leafhoppers, saltmarsh caterpillar, tobacco budworm, aphids, whiteflies, armyworms, ground beetles, crickets, loopers, <i>Lygus</i> bugs, stink bugs, wireworm adults	3A	A maximum of 0.3 lb ai/acre per season may be applied. Do not make applications less than 7 days apart.
Neemix 4.5 EC (azadirachtin)	4-16 fl oz	12	0	aphids, armyworms, cabbage looper, cutworms, leafminers, webworms, whiteflies	un	IGR and feeding repellent. OMRI-listed ² .
Orthene 97 (acephate)	0.5-1.0 lb	24	21	cabbage looper, fall armyworm, green peach aphid	1B	Do not use more than 2 lb aiper acre per season. All tops must be removed before shipment.
Platinum 75SG (thiamethoxam)	1.66-3.67 oz	12	30	aphids, flea beetles, leafhoppers, leafminers (suppression), whiteflies	4A	Maximum = 11 oz/acre or 3.67 oz/acre (75SG) per season. Do not use in conjunction with other 4A insecticides.
*Proclaim (emamectin benzoate)	2.4-4.8 oz	12	7	beet armyworm, corn earworm, fall armyworm, <i>Liriomyza</i> leafminers, loopers, tobacco budworm	6	Provides suppression of leafminers. Rotate with other products with different modes of action.
PyGanic Crop Protection EC 5.0 (pyrethrins)	4.5-18 fl oz	12	0	Aphids, beetles, caterpillars, leafhoppers, leafminers, thrips, whiteflies, others	3A	Can be used in greenhouses. Thorough coverage is essential. Breaks down rapidly in sunlight. OMRI-listed ² .
Radiant SC (spinetoram)	5-10 fl oz	4	1	armyworms (not yellowstriped), cabbage looper, corn earworm, <i>Liriomyza</i> leafminer, thrips	5	Maximum of 6 applications, no more than 2 consecutive applications before rotating to another MOA.
Requiem EC (extract of <i>Chenopodium ambrosioides</i>)	2.0-4.0 qt	4	0	green peach aphid, suppression of <i>Liriomyza</i> leafminers, potato aphid, turnip aphid, whiteflies	un	Apply before pests reach damaging levels.
Scorpion 35 SL insecticide (dinotefuran)	Foliar: 2-5.25 fl oz Soil: 9-10.5 fl oz	12	foliar - 7, soil - 21	brown stink bug, cucumber beetle, flea beetles, grasshoppers, green stink bug, harlequin bug, leafhoppers, leafminers, southern green stink bug, thrips, whiteflies, suppression of green peach aphid	4A	Use only one application method: foliar or soil. Maximum amount that can be applied per season: foliar, 10.5 fl oz; soil, 21 fl oz.
Sevin XLR; 4F; 80S (carbaryl)	XLR; 4F: 0.5-2 qt 80S: 0.63-2.5 lb	12	14	armyworms, aster leafhopper, corn earworm, fall armyworm, flea beetles, leafhoppers, <i>Lygus</i> bug, spittlebugs, stink bugs, tarnished plant bug	1A	Repeat, as needed, up to 5 times, with at least 7 days between applications.
Sivanto 200 SL (flupyradifurone)	7-14 fl oz	4	1	aphids, leafhoppers, whiteflies	4D	Maxium allowed per crop season per acre = 28 fl oz. Maximum crop seasons per year = 3.
SunSpray 98.8%, JMS Stylet-Oil, Saf-T-side, others (Oils, insecticidal)	3-6 qt/100 gal (JMS) 1-2 gal/100 gal	4	0	aphids, beetle larvae, leafhoppers, leafminers, mites, thrips, whiteflies (pests controlled vary by product)	--	See label for cautions on tank mixes. Organic Stylet-Oil and Saf-T-Side are OMRI-listed ² .
Torac Insecticide (tolfenpyrad)	14-21 fl oz	12	1	aphids (except lettuce aphid), flea beetles, leafhoppers, thrips, supression of lepidopteran pests and whiteflies	21A	Do not apply until at least 14 days after emergence or after transplanting. Do not apply more than 42 fl oz per acre per crop cycle and apply no more than twice per crop or 4 times per year. To protect pollinators, do not allow to drift to flowering weeds or nearby crops in bloom.
Trigard (cyromazine)	2.66 oz	12	7	leafminers	17	Do not make more than six applications per crop.
Trilogy (extract of neem oil)	0.5-2.0% V/V	4	0	aphids, mites, suppression of thrips and whiteflies	un	Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment. OMRI-listed ² .

Table 10.6. Insecticides approved for managing insect pests of celery. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.						
Trade Name Active Ingredient	Rate Product/acre	REI hours	Days to Harvest	Insects	MOA Code ¹	Notes ²
Venom Insecticide (dinotefuran)	foliar: 1-3 oz soil: 5-6.0 oz	12	7	Foliar: brown stink bug, cucumber beetle, flea beetle, grasshopper, green stink bug, suppression of green peach aphid and potato aphid, southern green stink bug, whiteflies Soil: suppression of green peach aphid and potato aphid, leafhoppers, leafminers, whiteflies	4A	Do not apply more than 6 oz per acre per season (foliar) or 12 oz per acre per season (soil). Do not use both methods of application. Do not apply when bees are foraging or to blooming plants. Toxic to bees for more than 38 hours following treatment.
Verimark (cyazypyr)	5.0-13.5 fl oz	4	N/A: applied at planting	beet armyworm, corn earworm, cabbage looper, diamondback moth, green peach aphids, <i>Liriomyza</i> leafminers, whitefly	28	Do not apply more than 13.5 fl oz at planting or more than 0.4 lb ai/acre of cyantraniliprole-containing products per crop, whether applied to soil or foliage.
Vetica (flubendiamide and buprofezin)	12.0-17.0 fl oz	12	7	armyworms, cabbage looper, corn earworm, cutworms, green cloverworm, imported cabbageworm, leafhoppers, saltmarsh caterpillar, tobacco budworm, whitefly	28, 16	Do not apply more than three times per season or apply more than 38 fl oz per acre per season. Use high rate for leafhoppers and whitefly.
Voliam Flexi (thiamethoxam, chlorantraniliprole)	4.0-7.0 oz	12	7	aphids, beet armyworm, cabbage looper, corn earworm fall armyworm, flea beetles, leafhoppers, southern armyworm, tobacco budworm, whiteflies	4A, 28	Do not apply more than 14 oz per acre per growing season. An adjuvant may be used when applying to celery.
*Vydate L (oxamyl)	2-4 pt	48	21	leafminers (except <i>Liriomyza trifolii</i>)	1A	Do not apply more than 24 pt/acre per season.
Xentari DF (<i>Bacillus thuringiensis</i> subspecies <i>aizawai</i>)	0.5-2.0 lb	4	0	caterpillars	11A	Treat when larvae are young. Thorough coverage is essential. May be used in the greenhouse. Can be used in organic production.

¹ Mode of Action (MOA) codes for plant pest insecticides from the Insecticide Resistance Action Committee (IRAC) Mode of Action Classification v. 7.3, February 2014. Number codes (1 through 28) are used to distinguish the main insecticide mode of action groups, with additional letters for certain sub-groups within each main group. All insecticides within the same group (with same number) indicate same active ingredient or similar mode of action. This information must be considered for the insecticide resistance management decisions. un = 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 the University of Florida Cooperative Extension Service 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 10.7. Insecticides approved for managing insect pests of okra crops.

Labels change frequently. Be sure to read a current product label before applying any chemical. Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.						
Insect or mite pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Days to Harvest	REI (hours)	Remarks ²
Aphids	1B	Malathion 5EC Malathion 8 (malathion)	1.2 pt	1	12	Maximum of 5 applications per year.
	3A	*Brigade 2 EC (bifenthrin)	2.1-6.4 fl oz	7	12	Do not apply more than 0.2 lb ai/acre per season.
	3A	Pyganic 5.0 (pyrethrins)	4.5-18 oz	0	12	Treat when insects first appear. Harmful to bees. OMRI-listed. ²
	4A	Admire Pro (imidacloprid) (see appropriate labels for other brands)	soil: 7-14 fl oz, foliar: 1.3-2.2 fl oz	soil: 21 foliar: 0	12	No more than 14 oz per acre per crop for soil application or 6.7 fl oz if used as a foliar spray.

Table 10.7. Insecticides approved for managing insect pests of okra crops. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.

Insect or mite pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Days to Harvest	REI (hours)	Remarks ²
	4A	Assail 30SG (acetamiprid)	2.0-4.0 oz	7	12	Do not make more than 4 applications per season.
	4D	Sivanto 200 SL (flupyradifurone)	foliar: 7-14 fl oz soil: 21-28 fl oz	foliar: 1 soil: 45	4	Foliar: Maximum allowed per acre per year: 28 fl oz. Soil: Maximum allowed: 28 fl oz per season with no more than 3 crop seasons per year.
	9C	Beleaf 50 SG (flonicamid)	2.0-2.8 oz	0	12	Do not apply more than 8.4 oz/acre per season.
	15	Rimon 0.83EC (novaluron)	9-12 fl oz	1	12	Do not apply more than 36 fl oz per acre per season. Do not apply more than twice for whiteflies and thrips.
	23	Movento (spirotetramat)	4-5 fl oz	1	24	Do not apply more than 10 fl oz per acre per season.
	28	Exirel (cyantraniliprole)	7.0-20.5 fl oz	1	12	Do not apply more than a total of 0.4 lb ai per crop of cyazypyr or cyantraniliprole-containing products.
	un	Aza-Direct (azadirachtin)	1-2 pts, up to 3.5 pts, if needed	0	4	Antifeedant, repellent, insect growth regulator. OMRI-listed ² .
	un	Azatin XL (azadirachtin)	5-21 fl oz	0	4	Antifeedant, repellent, insect growth regulator. Rate depends on pest-see label.
	un	Grandevo (Chromobacterium subsugae strain PRAA4-1)	1.0-3.0 lb	0	4	Can be used in organic production. OMRI-listed ² .
	un	Neemix 4.5 (azadirachtin)	4-16 fl oz	0	12	IGR and feeding repellent. OMRI-listed ² .
	un	Requiem EC (extract of <i>Chenopodium ambrosioides</i>)	2-4 qt	0	4	Apply before pests reach damaging levels.
	--	BotaniGard 22 WP, ES (<i>Beauveria bassiana</i>)	WP: 0.5-2 ES: 0.5-2 qt/100 gal	0	4	May be used in greenhouses. Contact dealer for recommendations if an adjuvant must be used. Not compatible in tank mix with fungicides.
	--	SunSpray 98.8%; Ultra-Fine; JMS Stylet Oil, Saf-T-Side, Others (oil, insecticidal)	1-2 gal/100 gal JMS: 3-6 qt/100 gal (JMS)	0	4	See label for tank mix cautions. Organic Stylet-Oil is OMRI-listed ² .
Beetles (including cucumber beetles, flea beetles)	1A	Sevin 80S, 4F, XLR (carbaryl)	80S: 1.25-1.88lb 4F, XLR: 1-1.5 qt	3	12	Do not apply more than a total of 6 qt or 7.5 lb per acre per season.
	1B	Malathion 5EC, 8 (malathion)	1.2 pt	1	12	Maximum of 5 applications per year.
	3A	*Capture LFR (bifenthrin)	3.4-8.5 fl oz, at planting	N/A- applied at planting	12	For mixing with liquid fertilizer to apply to soil at planting.
	3A	Pyganic 5.0 (pyrethrins)	4.5-18 oz	0	12	OMRI-listed. ²
	3S	*Mustang (zeta-cypermethrin)	2.4-4.3 oz	1	12	Do not make applications less than 7 days apart. Do not apply more than 0.3 lb ai/acre (25.8 fl oz of product) per season.
	4A	Admire Pro (imidacloprid)	soil: 7-14 fl oz, foliar: 1.3-2.2 fl oz	soil: 21 foliar: 0	12	No more than 14 oz per acre per crop for soil application or 6.7 fl oz if used as a foliar spray.
	4A	Assail 30SG (acetamiprid)	2.0-4.0 oz	7	12	Do not make more than 4 applications per season.
	15	Rimon 0.83EC (novaluron)	9-12 fl oz	1	12	Do not apply more than 36 fl oz per acre per season. Do not apply more than twice for whiteflies and thrips.
	un	Aza-Direct (azadirachtin)	1-2 pts, up to 3.5 pts, if needed	0	4	Antifeedant, repellent, insect growth regulator. OMRI-listed ² .

Table 10.7. Insecticides approved for managing insect pests of okra crops. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.

Insect or mite pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Days to Harvest	REI (hours)	Remarks ²
Caterpillars (including armyworms, loopers, tomato fruitworm -also known as corn earworm, caterpillars, cutworms)	1A	Sevin 80S, 4F, XLR (carbaryl)	80S: 1.25-1.88lb 4F, XLR: 1-1.5 qt	3	12	Do not apply more than a total of 6 qt or 7.5 lb per acre per season.
	3A	*Asana XL (0.66 EC) (esfenvalerate)	5.8-9.6 fl oz	1	12	Florida only.
	3A	*Brigade 2 EC (bifenthrin)	2.1-6.4 fl oz	7	12	Do not apply more than 0.2 lb ai/acre per season.
	3A	*Capture LFR (bifenthrin)	3.4-6.8 fl oz	N/A- applied at planting	12	For mixing with liquid fertilizer to apply to soil at planting.
	3A	Pyganic 5.0 (pyrethrins)	4.5-18 oz	0	12	OMRI-listed. ²
	3S	*Mustang (zeta-cypermethrin)	2.4-4.3 oz	1	12	Do not make applications less than 7 days apart. Do not apply more than 0.3 lb ai/acre (25.8 fl oz of product) per season.
	5	Entrust SC (spinosad)	1.5-10 fl oz	1	4	Do not apply more than 29 oz per acre per crop. OMRI-listed.
	5	Radiant SC (spinetoram)	5-10 fl oz	1	4	Control of leafminers and thrips may be improved with an adjuvant.
	11A	Crymax WDG (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.5-2.0 lb	0	4	Use high rate for armyworms. Treat when larvae are young.
	11A	Deliver (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.25-1.5 lb	0	4	Use higher rates for armyworms. OMRI-listed ² .
	11A	DiPel DF (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.5-2.0 lb	0	4	Can be used in organic production.
	11A	Javelin WG (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.12-1.50 lb	1	4	Treat when larvae are young. Thorough coverage is essential. OMRI-listed ² .
	11A	Xentari DF (<i>Bacillus thuringiensis</i> subspecies <i>aizawai</i>)	0.5-2.0 lb	0	4	Can be used in organic production.
	15	Rimon 0.83EC (novaluron)	9-12 fl oz	1	12	Do not apply more than 36 fl oz per acre per season. Do not apply more than twice for whiteflies and thrips.
	18	Intrepid 2F (methoxyfenozide)	4-16 fl oz	1	4	Do not apply more than 64 fl oz per acre per season.
	22	Avaunt (indoxacarb)	2.5-3.5 oz	3	12	Maximum = 14 oz/acre per crop
	28	Belt SC (flubendiamide)	1.5 fl oz	1	12	Do not apply more than 4.5 fl oz/acre per season.
	28	Coragen (chlorantraniliprole)	3.5-7.5 fl oz	1	4	Can be applied by drip chemigation or as a soil application at planting as well as a foliar spray. See label. For hornworms, can use as little as 2.0 fl oz/acre when applied as a foliar spray. Make no more than 4 applications per crop.
	28	Exirel (cyantraniliprole)	7.0-20.5 fl oz	1	12	Do not apply more than a total of 0.4 lb ai per crop of cyazypyr or cyantraniliprole-containing products.
	28,16	Vetiva (flubendiamide and buprofezin)	12.0-17.0 fl oz	1	12	Do not apply more than 3 times per season or apply more than 38 fl oz per acre per season. Use high rate for whiteflies and leafhoppers.
un	Aza-Direct (azadirachtin)	1-2 pts, up to 3.5 pts, if needed	0	4	Antifeedant, repellent, insect growth regulator. OMRI-listed ² .	
un	Azatin XL (azadirachtin)	5-21 fl oz	0	4	Antifeedant, repellent, insect growth regulator.	
un	Grandevo (<i>Chromobacterium</i> subspecies <i>sugae</i> strain PRAA4-1)	1.0-3.0 lb	0	4	Can be used in organic production. OMRI-listed ² .	
un	Neemix 4.5 (azadirachtin)	4.5-18 fl oz	0	12	IGR and feeding repellent. OMRI-listed ² .	

Table 10.7. Insecticides approved for managing insect pests of okra crops. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.

Insect or mite pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Days to Harvest	REI (hours)	Remarks ²
	--	BotaniGard 22 WP, ES (<i>Beauveria bassiana</i>)	WP: 0.5-2 qt/100 gal ES: 0.5-2	0	4	May be used in greenhouses. Contact dealer for recommendations if an adjuvant must be used. Not compatible in tank mix with fungicides.
Fire ants	7A	Extinguish ((S)-methoprene)	1.0-1.5 lb	0	4	Slow-acting IGR (insect growth regulator). Best applied early spring and fall where crop will be grown. Colonies will be reduced after three weeks and eliminated after 8 to 10 weeks. May be applied by ground equipment or aerially.
	7C	Esteem Ant Bait (pyriproxyfen)	1.5-2.0 lb	1	12	Apply when ants are actively foraging.
Leafminers	3A	*Brigade 2 EC (bifenthrin)	2.1-6.4 fl oz	7	12	Do not apply more than 0.2 lb ai/acre per season.
	5	Entrust SC (spinosad)	1.5-10 fl oz	1	4	Do not apply more than 29 oz per acre per crop. OMRI-listed.
	5	Radiant SC (spinetoram)	5-10 fl oz	1	4	Control of leafminers and thrips may be improved with an adjuvant.
	15	Rimon 0.83EC (novaluron)	9-12 fl oz	1	12	Do not apply more than 36 fl oz per acre per season. Do not apply more than twice for whiteflies and thrips.
	28	Exirel (cyantraniliprole)	7.0-20.5 fl oz	1	12	Do not apply more than a total of 0.4 lb ai per crop of cyazypyr or cyantraniliprole-containing products.
	28	Verimark (cyantraniliprole)	5-10 fl oz	1	4	Apply at planting or through drip chemigation, but do not make more than 1 drip chemigation application per crop if an at planting application was made. Do not apply more than a total of 0.4 lb ai per crop of cyazypyr or cyantraniliprole-containing products (such as Exirel).
	un	Aza-Direct (azadirachtin)	1-2 pts, up to 3.5 pts, if needed	0	4	Antifeedant, repellent, insect growth regulator. OMRI-listed ² .
	un	Azatin XL (azadirachtin)	5-21 fl oz	0	4	Antifeedant, repellent, insect growth regulator. Rate depends on pest-see label.
	un	Neemix 4.5 (azadirachtin)	4.5-18 fl oz	0	12	IGR and feeding repellent. OMRI-listed ² .
	--	SunSpray 98.8%; Ultra-Fine; JMS Stylet Oil, Saf-T-Side, Others (oil, insecticidal)	1-2 gal/100 gal JMS: 3-6 qt/100 gal (JMS)	0	4	See label for tank mix cautions. Organic Stylet-Oil is OMRI-listed ² .
Mites	1B	Malathion 5EC Malathion 8 (malathion)	1.2 pt	1	12	Maximum of 5 applications per year.
	3A	Pyganic 5.0 (pyrethrins)	4.5-18 oz	0	12	OMRI-listed. ²
	10B	Zeal (etoxazole)	2.0-3.0 oz	7	12	Do not make more than one application per season. Do not use with an adjuvant or surfactant.
	20B	Kanemite 15 SC (acequinocyl)	31 fl oz	7	12	Two applications per year, at least 21 days apart.
	21A	Portal (fenpyroximate)	2.0 pt	1	12	Do not make more than two applications per season.
	23	Movento (spirotetramat)	4-5 fl oz	1	24	Do not apply more than 10 fl oz per acre per season.
	un	Acramite-50WS (bifenazate)	0.75-1.0 lb	3	12	One application per season.
	un	Aza-Direct (azadirachtin)	1-2 pts, up to 3.5 pts, if needed	0	4	Antifeedant, repellent, insect growth regulator. OMRI-listed ² .
	un	Trilogy (extract of neem oil)	1.0-2.0% V/V	0	4	Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment. OMRI-listed ² .
	--	SunSpray 98.8%; Ultra-Fine; JMS Stylet Oil, Saf-T-Side, Others (oil, insecticidal)	1-2 gal/100 gal JMS: 3-6 qt/100 gal (JMS)	0	4	See label for tank mix cautions. Organic Stylet-Oil is OMRI-listed ² .
Stink Bugs	1A	Sevin 80S, 4F, XLR (carbaryl)	80S: 1.25-1.88lb 4F, XLR: 1-1.5 qt	3	12	Do not apply more than a total of 6 qt or 7.5 lb per acre per season.

Table 10.7. Insecticides approved for managing insect pests of okra crops. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical.
Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.

Insect or mite pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Days to Harvest	REI (hours)	Remarks ²
	3A	*Brigade 2 EC (bifenthrin)	2.1-6.4 fl oz	7	12	Do not apply more than 0.2 lb ai/acre per season.
	3A	Pyganic 5.0 (pyrethrins)	4.5-18 oz	0	12	OMRI-listed. ²
	3S	*Mustang (zeta-cypermethrin)	2.4-4.3 oz	1	12	Do not make applications less than 7 days apart. Do not apply more than 0.3 lb ai/acre (25.8 fl oz of product) per season.
	4D	Sivanto 200 SL (flupyradifurone)	foliar: 7-14 fl oz soil: 21-28 fl oz	foliar: 1 soil: 45	4	Foliar: Maximum allowed per acre per year: 28 fl oz. Soil: Maximum allowed: 28 fl oz per season with no more than 3 crop seasons per year.
	15	Rimon 0.83EC (novaluron)	9-12 fl oz	1	12	Do not apply more than 36 fl oz per acre per season. Do not apply more than twice for whiteflies and thrips.
Thrips (check label for species controlled)	1B	Malathion 5EC Malathion 8 (malathion)	1.2 pt	1	12	Maximum of 5 applications per year.
	3A	Pyganic 5.0 (pyrethrins)	4.5-18 oz	0	12	OMRI-listed. ²
	4A	Admire Pro (imidacloprid)	soil: 7-14 fl oz, foliar: 1.3-2.2 fl oz	soil: 21 foliar: 0	12	No more than 14 oz per acre per crop for soil application or 6.7 fl oz if used as a foliar spray.
	5	Entrust SC (spinosad)	1.5-10 fl oz	1	4	Do not apply more than 29 oz per acre per crop. OMRI-listed.
	15	Rimon 0.83EC (novaluron)	9-12 fl oz	1	12	Do not apply more than 36 fl oz per acre per season. Do not apply more than twice for whiteflies and thrips.
	un	Aza-Direct (azadirachtin)	1-2 pts, up to 3.5 pts, if needed	0	4	Antifeedant, repellent, insect growth regulator. OMRI-listed ² .
	un	Grandevo (Chromobacterium subsugae strain PRAA4-1)	1.0-3.0 lb	0	4	Can be used in organic production. OMRI-listed ² .
	un	Requiem EC (extract of <i>Chenopodium ambrosioides</i>)	2-4 qt	0	4	Apply before pests reach damaging levels.
	--	BotaniGard 22 WP, ES (<i>Beauveria bassiana</i>)	WP: 0.5-2 ES: 0.5-2 qt/100 gal	0	4	May be used in greenhouses. Contact dealer for recommendations if an adjuvant must be used. Not compatible in tank mix with fungicides.
--	SunSpray 98.8%; Ultra-Fine; JMS Stylet Oil, Saf-T-Side, Others (oil, insecticidal)	1-2 gal/100 gal JMS: 3-6 qt/100 gal (JMS)	0	4	See label for tank mix cautions. Organic Stylet-Oil is OMRI-listed ² .	
Whitefly	1B	Malathion 5EC Malathion 8 (malathion)	1.2 pt	1	12	Maximum of 5 applications per year. Must be tankmixed with a pyrethroid for effective control.
	3A	*Brigade 2 EC (bifenthrin)	2.1-6.4 fl oz	7	12	Do not apply more than 0.2 lb ai/acre per season. Best results if tank mixed with malathion
	3A	Pyganic 5.0 (pyrethrins)	4.5-18 oz	0	12	OMRI-listed. ²
	4A	Admire Pro (imidacloprid)	soil: 7-14 fl oz, foliar: 1.3-2.2 fl oz	soil: 21 foliar: 0	12	No more than 14 oz per acre per crop for soil application or 6.7 fl oz if used as a foliar spray.
	4A	Assail 30SG (acetamiprid)	2.0-4.0 oz	7	12	Do not make more than 4 applications per season.
	4D	Sivanto 200 SL (flupyradifurone)	foliar: 7-14 fl oz soil: 21-28 fl oz	foliar: 1 soil: 45	4	Foliar: Maximum allowed per acre per year: 28 fl oz. Soil: Maximum allowed: 28 fl oz per season with no more than 3 crop seasons per year.
	7C	Knack IGR (pyriproxyfen)	8-10 fl oz	7	12	Immatures only. Apply when nymphs first appear. Do not apply more than twice per growing season.
	15	Rimon 0.83EC (novaluron)	9-12 fl oz	1	12	Do not apply more than 36 fl oz per acre per season. Do not apply more than twice for whiteflies and thrips.
	16	Courier 40SC (buprofezin)	9.0-13.6 fl oz	1	12	Immatures only. Make no more than 2 applications per crop cycle.

Table 10.7. Insecticides approved for managing insect pests of okra crops. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical.
Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.

Insect or mite pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Days to Harvest	REI (hours)	Remarks ²
	23	Movento (spirotetramat)	4-5 fl oz	1	24	Do not apply more than 10 fl oz per acre per season.
	28	Exirel (cyantraniliprole)	7.0-20.5 fl oz	1	12	Do not apply a total of more than 0.4 lb ai per acre of cyazypyr or cyantraniliprole-containing products per crop, either as foliar or soil applications.
	28	Verimark (cyantraniliprole)	5-10 fl oz	1	4	Apply at planting or through drip chemigation, but do not make more than 1 drip chemigation application per crop if an at planting application was made. Do not apply more than a total of 0.4 lb ai per crop of cyazypyr or cyantraniliprole-containing products (such as Exirel).
	28,16	Vetica (flubendiamide and buprofezin)	12.0-17.0 fl oz	1	12	Do not apply more than 3 times per season or apply more than 38 fl oz per acre per season. Use high rate for whiteflies and leafhoppers.
	un	Aza-Direct (azadirachtin)	1-2 pts, up to 3.5 pts, if needed	0	4	Antifeedant, repellent, insect growth regulator. OMRI-listed ² .
	un	Azatin XL (azadirachtin)	5-21 fl oz	0	4	Antifeedant, repellent, insect growth regulator. Rate depends on pest-see label.
	un	Grandevo (Chromobacterium subtsugae strain PRAA4-1)	1.0-3.0 lb	0	4	OMRI-listed ² .
	un	Neemix 4.5 (azadirachtin)	4-16 fl oz	0	12	IGR and feeding repellent. OMRI-listed ² .
	un	Requiem EC (extract of <i>Chenopodium ambrosioides</i>)	2-4 qt	0	4	Apply before pests reach damaging levels.
	--	BotaniGard 22 WP, ES (<i>Beauveria bassiana</i>)	WP: 0.5-2 qt/100 gal ES: 0.5-2	0	4	May be used in greenhouses. Contact dealer for recommendations if an adjuvant must be used. Not compatible in tank mix with fungicides.
	--	SunSpray 98.8%; Ultra-Fine; JMS Stylet Oil, Saf-T-Side, Others (oil, insecticidal)	1-2 gal/100 gal JMS: 3-6 qt/100 gal (JMS)	0	4	See label for tank mix cautions. Organic Stylet-Oil is OMRI-listed ² .
Wireworm	3A	*Capture LFR (bifenthrin)	3.4-6.8 fl oz	N/A- applied at planting	12	For mixing with liquid fertilizer to apply to soil at planting.

¹ Mode of Action (MOA) codes for plant pest insecticides from the Insecticide Resistance Action Committee (IRAC) Mode of Action Classification v. 7.3, February 2014. Number codes (1 through 28) are used to distinguish the main insecticide mode of action groups, with additional letters for certain sub-groups within each main group. All insecticides within the same group (with same number) indicate same active ingredient or similar mode of action. This information must be considered for the insecticide resistance management decisions. un = 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 the University of Florida Cooperative Extension Service 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 10.8. Insecticides approved for managing insect pests of parsley.

Labels change frequently. Be sure to read a current product label before applying any chemical.

Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.

Pest	MOA Code ¹	Trade Name Active Ingredient	Rate Product/acre	REI hours	Days to Harvest	Notes
Aphids	1B	Malathion 5EC (malathion)	1.5-2.4 pt	24	7	Do not apply more than twice per year. Highly toxic to bees. Do not apply when bees are foraging in the area.
	1B	Malathion 8 F (malathion)	1.5 pt	24	7	Do not apply more than twice per year. Highly toxic to bees. Do not apply when bees are foraging in the area.
	3A	*Pounce 25 WP (permethrin)	3.2-12.8 oz	12	1	Do not apply more than 1.0 lb ai/acre per season.
	3A	PyGanic Crop Protection EC 5.0 (pyrethrins)	4.5-18 fl oz	12	0	Can be used in greenhouses. Thorough coverage is essential. Breaks down rapidly in sunlight. OMRI-listed.
	3A	*Mustang (zeta-cypermethrin)	2.4-4.3 oz	12	1	A maximum of 0.3 lb ai/acre per season may be applied. Do not make applications less than 7 days apart.
	4A	Actara (thiamethoxam)	1.5-5.5 oz	12	7	Do not use if other 4A insecticides have been or will be used. Toxic to bees. See note for Admire.
	4A	Assail 30SG (acetamiprid)	2.0-4.0 oz	12	7	Begin applications for whiteflies when first adults are noticed. Do not apply more than 5 times per season or apply more often than every 7 days.
	4A	Belay Insecticide (clothianidin)	3-4 fl oz	12	7	Do not apply treatments less than 10 days apart. Maximum of 12 fl oz per year, regardless of application method. Highly toxic to bees for 5 days after application. Do not allow drift to blooming weeds or nearby crops in bloom.
	4A	Belay Insecticide (clothianidin)	9-12 fl oz (soil application)	12	21	Maximum of 12 fl oz per year, regardless of application method. Highly toxic to bees for 5 days after application. Do not allow drift to blooming weeds or nearby crops in bloom.
	4A	Belay 50 WDG (clothianidin)	1.6-2.1 oz	12	7	Do not apply more than 6.4 oz per acre per season. Do not use an adjuvant. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	4A, 28	Durivo (thiamethoxam, chlorantraniliprole)	10-13 oz	12	30	May be applied by one of several soil application methods. One application per season.
	4A	Platinum 75SG (thiamethoxam)	1.66-3.67 oz	12	30	Maximum = 3.67 oz/acre per season. Do not use in conjunction with other 4A insecticides.
	4A	Scorpion 35 SL insecticide (dinotefuran)	Foliar: 2-5.25 fl oz Soil: 9-10.5 fl oz	12	foliar - 7, soil - 21	No more than 2 applications at highest rate per acre per season. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	4A	Venom Insecticide (dinotefuran)	foliar: 1-3 oz; soil: 5-6.0 oz	12	foliar: 7; soil: 21	Use only one application method (soil or foliar, not both). Do not apply more than 6 oz/acre (foliar) or 12 oz/acre (soil) per season. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	4A, 28	Voliam Flexi (thiamethoxam, chlorantraniliprole)	4.0-7.0 oz	12	7	Do not apply more than 14 oz per acre per growing season. Do not use an adjuvant. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	4C	Closer SC (sulfoxaflor)	1.5-5.75 fl oz	12	3	Do not make more than 2 consecutive applications or more than 4 total applications per season.
	4D	Sivanto 200 SL (flupyradifurone)	7-14 fl oz	4	1	Minimum interval between applications=7 days. Maximum allowed per crop season=28 fl oz. Maximum crops per year=3.
	9B	Fulfill (pymetrozine)	2.75 oz	12	7	Apply when aphids first appear, before populations build to damaging levels. Two applications (maximum allowed) may be needed to control persistent aphid populations.
	9C	Beleaf 50 SG (flonicamid)	2.0-2.8 oz	12	0	Do not apply more than 8.4 oz/acre per season. Begin applications before pests reach damaging levels.
	28	Exirel (cyazapyr)	7.0-20.5 fl oz	12	1	Do not apply more than 0.4 lb ai per acre per crop, including other products containing cyazapyr or cyantraniliprole. Do not apply while bees are foraging in the area. See label.
23	Movento (spirotetramat)	4.0-5.0 fl oz	24	3	Do not apply more than 10 fl oz per acre per crop.	
28	Verimark (cyazapyr)	5.0-13.5 fl oz	4	N/A- applied at planting	Do not apply more than 0.4 lb ai per acre per crop, including other products containing cyazapyr or cyantraniliprole (such as Exirel).	
--	Aza-Direct (azadirachtin)	1-2 pts, to 3.5 pts if needed	4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed.	
--	Azatin XL (azadirachtin)	5-21 fl oz	4	0	Antifeedant, repellent, insect growth regulator.	

Table 10.8. Insecticides approved for managing insect pests of parsley. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.

Pest	MOA Code ¹	Trade Name Active Ingredient	Rate Product/acre	REI hours	Days to Harvest	Notes
	--	BotaniGard ES (<i>Beauveria bassiana</i>)	0.5-2 qt/100 gal	4	0	May be used in greenhouses. Contact dealer for recommendations if an adjuvant must be used. Not compatible in tank mix with fungicides.
	--	Grandevo (<i>Chromobacterium subsugae</i> strain PRAA4-1)	1-3 lb	4	0	Can be used in organic production. OMRI-listed.
	--	M-Pede 49% EC (oil, insecticidal)	1-2% V/V	12	0	OMRI-listed.
	--	Neemix 4.5 (azadirachtin)	4-16 fl oz	12	0	IGR and feeding repellent. OMRI-listed.
	--	Trilogy (extract of neem oil)	1.0-2.0% V/V	4	0	Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment. OMRI-listed.
Flea beetles	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 0.63-2.5 lb XLR; 4F: 0.5-2.0 qt	12	14	Do not apply more than a total of 7.5 lb or 6 qt per acre per crop. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	3A	*Baythroid XL (beta-cyfluthrin)	0.8-3.2 fl oz	12	0	Maximum of 12.8 fl oz per acre per season.
	3A	*Mustang (zeta-cypermethrin)	2.4-4.3 oz	12	1	A maximum of 0.3 lb ai/acre per season may be applied. Do not make applications less than 7 days apart.
	4A	Actara (thiamethoxam)	1.5-5.5 oz	12	7	Do not use if other 4A insecticides have been or will be used. Toxic to bees. See note for Admire.
	4A	Belay Insecticide (clothianidin)	3-4 fl oz	12	7	Do not apply treatments less than 10 days apart. Maximum of 12 fl oz per year, regardless of application method. Highly toxic to bees for 5 days after application. Do not allow drift to blooming weeds or nearby crops in bloom.
	4A	Belay Insecticide (clothianidin)	9-12 fl oz (soil application)	12	21	Maximum of 12 fl oz per year, regardless of application method. Highly toxic to bees for 5 days after application. Do not allow drift to blooming weeds or nearby crops in bloom.
	4A	Belay 50 WDG (clothianidin)	1.6-2.1 oz	12	7	Do not apply more than 6.4 oz per acre per season. Do not use an adjuvant. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	4A, 28	Durivo (thiamethoxam, chlorantraniliprole)	10-13 oz	12	30	May be applied by one of several soil application methods. One application per season.
	4A	Platinum 75SG (thiamethoxam)	1.66-3.67 oz	12	30	Maximum = 3.67 oz/acre per season. Do not use in conjunction with other 4A insecticides.
	4A	Scorpion 35 SL insecticide (dinotefuran)	Foliar: 2-5.25 fl oz Soil: 9-10.5 fl oz	12	foliar - 7, soil - 21	No more than 2 applications at highest rate per acre per season. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	4A	Venom Insecticide (dinotefuran)	foliar: 1-3 oz; soil: 5-6.0 oz	12	foliar: 7; soil: 21	Use only one application method (soil or foliar, not both). Do not apply more than 6 oz/acre (foliar) or 12 oz/acre (soil) per season. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	4A, 28	Voliam Flexi (thiamethoxam, chlorantraniliprole)	4.0-7.0 oz	12	7	Do not apply more than 14 oz per acre per growing season. Do not use an adjuvant. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
Caterpillars (includes beet armyworm, cabbage looper, celery leaf-tier, corn earworm, cutworms, fall armyworm)	1A	*Larvin 3.2 (thiodicarb)	16-30 fl oz	48	14	Do not exceed 60 fl oz per acre per season. Do not apply when bees are foraging in the area.
	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 0.63-2.5 lb XLR; 4F: 0.5-2.0 qt	12	14	Do not apply more than a total of 7.5 lb or 6 qt per acre per crop. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	3A	*Baythroid XL (beta-cyfluthrin)	0.8-3.2 fl oz	12	0	Maximum of 12.8 fl oz per acre per season.
	3A	*Ambush 25W (permethrin)	6.4-12.8 oz	12	1	Do not apply more than 2 lb ai/acre per season.
	3A	*Mustang (zeta-cypermethrin)	2.4-4.3 oz	12	1	A maximum of 0.3 lb ai/acre per season may be applied. Do not make applications less than 7 days apart.
	3A	*Pounce 25 WP (permethrin)	3.2-12.8 oz	12	1	Do not apply more than 1.0 lb ai/acre per season.
	3A	PyGanic Crop Protection EC 5.0 (pyrethrins)	4.5-18 fl oz	12	0	Can be used in greenhouses. Thorough coverage is essential. Breaks down rapidly in sunlight. OMRI-listed.

Table 10.8. Insecticides approved for managing insect pests of parsley. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical.

Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.

Pest	MOA Code ¹	Trade Name Active Ingredient	Rate Product/acre	REI hours	Days to Harvest	Notes
	4A, 28	Durivo (thiamethoxam, chlorantraniliprole)	10-13 oz	12	30	May be applied by one of several soil application methods. One application per season.
	4A, 28	Voliam Flexi (thiamethoxam, chlorantraniliprole)	4.0-7.0 oz	12	7	Do not apply more than 14 oz per acre per growing season. Do not use an adjuvant. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	5	Entrust SC (spinosad)	1.5-10.0 fl oz	4	1	Use no more than 29 oz per acre per crop. OMRI-listed.
	5	Radiant SC (spinetoram)	5-10 fl oz	4	1	Maximum of 6 applications, no more than 2 consecutive applications before rotating to another MOA.
	6	*Proclaim (emamectin benzoate)	2.4-4.8 oz	12	7	Do not apply more than 28.8 oz/A per season.
	11A	Agree WG (<i>Bacillus thuringiensis</i> subspecies <i>aizawai</i>)	0.5-2.0 lb	4	0	Apply when larvae are small for best control. OMRI-listed.
	11A	Biobit HP (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.5-2.0 lb	4	0	Treat when larvae are young. Good coverage is essential. Can be used in the greenhouse. OMRI-listed.
	11A	Crymax WDG (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.5-2.0 lb	4	0	Use high rate for armyworms. Treat when larvae are young.
	11A	Deliver (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.25-1.5 lb	4	0	Use higher rates for armyworms. OMRI-listed.
	11A	DiPel DF (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.5-2.0 lb	4	0	Treat when larvae are young. Good coverage is essential. See label for rates for specific pests. Can be used for organic production.
	11A	Javelin WG (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.12-1.5 lb	4	0	Treat when larvae are young. Thorough coverage is essential. OMRI-listed.
	11A	Xentari DF (<i>Bacillus thuringiensis</i> subspecies <i>aizawai</i>)	0.5-2.0 lb	4	0	Treat when larvae are young. Thorough coverage is essential. May be used in the greenhouse. Can be used in organic production.
	18	Intrepid 2F (methoxyfenozide)	4-10 fl oz	4	1	Do not apply more than 64 fl oz per acre per season.
	22	Avaunt (indoxacarb)	2.5-6.0 oz	12	3	Do not apply more than 24 ounces of product per acre per crop.
	28	Belt SC (flubendiamide)	1.5 fl oz	12	1	Do not apply more than 4.5 fl oz/acre per season.
	28	Coragen (rynaxypyr)	3.5-7.5 fl oz	4	1	May be applied by drip chemigation, in addition to foliar and various soil application methods.
	28	Exirel (cyazypyr)	7.0-20.5 fl oz	12	1	Do not apply more than 0.4 lb ai per acre per crop, including other products containing cyazypyr or cyantraniliprole. Do not apply while bees are foraging in the area. See label.
	28	Verimark (cyazypyr)	5.0-13.5 fl oz	4	N/A- applied at planting	Do not apply more than 0.4 lb ai per acre per crop, including other products containing cyazypyr or cyantraniliprole (such as Exirel).
	28, 16	Vetica (flubendiamide and buprofezin)	12.0-17.0 fl oz	12	7	No more than 3 applications per season or 38 fl oz per acre per season.
	--	Aza-Direct (azadirachtin)	1-2 pts, to 3.5 pts if needed	4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed.
	--	Azatin XL (azadirachtin)	5-21 fl oz	4	0	Antifeedant, repellent, insect growth regulator.
	--	Grandevo (<i>Chromobacterium subtsugae</i> strain PRAA4-1)	1-3 lb	4	0	Can be used in organic production. OMRI-listed.
	--	Neemix 4.5 (azadirachtin)	4-16 fl oz	12	0	IGR and feeding repellent. OMRI-listed.

Table 10.8. Insecticides approved for managing insect pests of parsley. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.

Pest	MOA Code ¹	Trade Name Active Ingredient	Rate Product/acre	REI hours	Days to Harvest	Notes
Fire ants	7A	Extinguish (S)-methoprene)	1.0-1.5 lb	4	0	Slow-acting IGR (insect growth regulator). Best applied early spring and fall where crop will be grown. Colonies will be reduced after three weeks and eliminated after 8 to 10 weeks. May be applied by ground equipment or aerially.
Grasshoppers	3A	*Baythroid XL (beta-cyfluthrin)	0.8-3.2 fl oz	12	0	Maximum of 12.8 fl oz per acre per season.
	4A	Venom Insecticide (dinotefuran)	foliar: 1-3 oz; soil: 5-6.0 oz	12	foliar: 7; soil: 21	Use only one application method (soil or foliar, not both). Do not apply more than 6 oz/acre (foliar) or 12 oz/acre (soil) per season. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
Leafhoppers	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 0.63-2.5 lb XLR; 4F: 0.5-2.0 qt	12	14	Do not apply more than a total of 7.5 lb or 6 qt per acre per crop. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	3A	*Ambush 25W (permethrin)	6.4-12.8 oz	12	1	Do not apply more than 2 lb ai/acre per season.
	3A	*Baythroid XL (beta-cyfluthrin)	0.8-3.2 fl oz	12	0	Maximum of 12.8 fl oz per acre per season.
	3A	*Mustang (zeta-cypermethrin)	2.4-4.3 oz	12	1	A maximum of 0.3 lb ai/acre per season may be applied. Do not make applications less than 7 days apart.
	3A	*Pounce 25 WP (permethrin)	3.2-12.8 oz	12	1	Do not apply more than 1.0 lb ai/acre per season.
	3A	PyGanic Crop Protection EC 5.0 (pyrethrins)	4.5-18 fl oz	12	0	Can be used in greenhouses. Thorough coverage is essential. Breaks down rapidly in sunlight. OMRI-listed.
	4A	Actara (thiamethoxam)	1.5-5.5 oz	12	7	Do not use if other 4A insecticides have been or will be used. Toxic to bees. See note for Admire.
	4A	Admire Pro (imidacloprid)	soil: 4.4-10.5 fl oz, foliar: 1.3 fl oz	12	soil: 21, foliar: 7	Limited to 10.5 fl oz per acre per season for soil application or 6.5 fl oz for foliar applications. Toxic to bees. Do not allow drift to blooming weeds or nearby crops in bloom.
	4A	Belay Insecticide (clothianidin)	3-4 fl oz	12	7	Do not apply treatments less than 10 days apart. Maximum of 12 fl oz per year, regardless of application method. Highly toxic to bees for 5 days after application. Do not allow drift to blooming weeds or nearby crops in bloom.
	4A	Belay Insecticide (clothianidin)	9-12 fl oz (soil application)	12	21	Maximum of 12 fl oz per year, regardless of application method. Highly toxic to bees for 5 days after application. Do not allow drift to blooming weeds or nearby crops in bloom.
	4A	Belay 50 WDG (clothianidin)	1.6-2.1 oz	12	7	Do not apply more than 6.4 oz per acre per season. Do not use an adjuvant. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	4A, 28	Durivo (thiamethoxam, chlorantraniliprole)	10-13 oz	12	30	May be applied by one of several soil application methods. One application per season.
	4A	Platinum 75SG (thiamethoxam)	1.66-3.67 oz	12	30	Maximum = 3.67 oz/acre per season. Do not use in conjunction with other 4A insecticides.
	4A	Scorpion 35 SL insecticide (dinotefuran)	foliar: 2-5.25 fl oz soil: 9-10.5 fl oz	12	foliar: 7; soil: 21	No more than 2 applications at highest rate per acre per season. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	4A	Venom Insecticide (dinotefuran)	foliar: 1-3 oz; soil: 5-6.0 oz	12	foliar: 7; soil: 21	Use only one application method (soil or foliar, not both). Do not apply more than 6 oz/acre (foliar) or 12 oz/acre (soil) per season. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	4D	Sivanto 200 SL (flupyradifurone)	7-14 fl oz	4	1	Minimum interval between applications=7 days. Maximum allowed per crop season=28 fl oz. Maximum crops per year=3.
	16	Courier 40SC (buprofezin)	9.0-13.6 fl oz	12	7	Do not make more than 2 applications per crop cycle. IGR targets immatures.
	28, 16	Vetica (flubendiamide and buprofezin)	12.0-17.0 fl oz	12	7	No more than 3 applications per season or 38 fl oz per acre per season.
	--	Aza-Direct (azadirachtin)	1-2 pts, to 3.5 pts if needed	4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed.
	--	Azatin XL (azadirachtin)	5-21 fl oz	4	0	Antifeedant, repellent, insect growth regulator.
--	Neemix 4.5 (azadirachtin)	4-16 fl oz	12	0	IGR and feeding repellent. OMRI-listed.	

Table 10.8. Insecticides approved for managing insect pests of parsley. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.

Pest	MOA Code ¹	Trade Name Active Ingredient	Rate Product/acre	REI hours	Days to Harvest	Notes
Leafminers	3A	*Ambush 25W (permethrin)	6.4-12.8 oz	12	1	Do not apply more than 2 lb ai/acre per season.
	3A	*Pounce 25 WP (permethrin)	3.2-12.8 oz	12	1	Do not apply more than 1.0 lb ai/acre per season.
	3A	PyGanic Crop Protection EC 5.0 (pyrethrins)	4.5-18 fl oz	12	0	Can be used in greenhouses. Thorough coverage is essential. Breaks down rapidly in sunlight. OMRI-listed.
	4A	Belay 50 WDG (clothianidin)	1.6-2.1 oz	12	7	Do not apply more than 6.4 oz per acre per season. Do not use an adjuvant. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	4A	Platinum 75SG (thiamethoxam)	1.66-3.67 oz	12	30	Maximum = 3.67 oz/acre per season. Do not use in conjunction with other 4A insecticides.
	4A	Scorpion 35 SL insecticide (dinotefuran)	foliar: 2-5.25 fl oz soil: 9-10.5 fl oz	12	foliar: 7; soil: 21	No more than 2 applications at highest rate per acre per season. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	4A	Venom Insecticide (dinotefuran)	foliar: 1-3 oz; soil: 5-6.0 oz	12	foliar: 7; soil: 21	Use only one application method (soil or foliar, not both). Do not apply more than 6 oz/acre (foliar) or 12 oz/acre (soil) per season. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	5	Entrust SC (spinosad)	1.5-10.0 fl oz	4	1	Use no more than 29 oz per acre per crop. OMRI-listed.
	5	Radiant SC (spinetoram)	5-10 fl oz	4	1	Maximum of 6 applications, no more than 2 consecutive applications before rotating to another MOA.
	6	*Agri-Mek SC (abamectin)	1.75-3.5 fl oz	12	7	No more than 2 sequential applications. Must be used with an adjuvant (but not binder sticker types). Not for use on leafy vegetables grown for transplant.
	6	*Proclaim (emamectin benzoate)	2.4-4.8 oz	12	7	Do not apply more than 28.8 oz/A per season.
	17	Trigard (cyromazine)	2.66 oz	12	7	No more than 5 applications per crop.
	28	Coragen (rynaxypyr)	3.5-7.5 fl oz	4	1	May be applied by drip chemigation, in addition to foliar and various soil application methods.
	28	Exirel (cyazypyr)	7.0-20.5 fl oz	12	1	Do not apply more than 0.4 lb ai per acre per crop, including other products containing cyazypyr or cyantraniliprole. Do not apply while bees are foraging in the area. See label.
	28	Verimark (cyazypyr)	5.0-13.5 fl oz	4	N/A- applied at planting	Do not apply more than 0.4 lb ai per acre per crop, including other products containing cyazypyr or cyantraniliprole (such as Exirel).
	--	Aza-Direct (azadirachtin)	1-2 pts, to 3.5 pts if needed	4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed.
	--	Azatin XL (azadirachtin)	5-21 fl oz	4	0	Antifeedant, repellent, insect growth regulator.
	--	Neemix 4.5 (azadirachtin)	4-16 fl oz	12	0	IGR and feeding repellent. OMRI-listed.
	--	Requiem EC (extract of <i>Chenopodium ambrosioides</i>)	2.0-4.0 qt	4	0	Apply before pests reach damaging levels.
	Twospotted spider mite	6	*Agri-Mek SC (abamectin)	1.75-3.5 fl oz	12	7
Plant bugs	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 0.63-2.5 lb XLR; 4F: 0.5-2.0 qt	12	14	Do not apply more than a total of 7.5 lb or 6 qt per acre per crop. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	9C	Beleaf 50 SG (flonicamid)	2.0-2.8 oz	12	0	Do not apply more than 8.4 oz/acre per season. Begin applications before pests reach damaging levels.
Planthoppers	16	Courier 40SC (buprofezin)	9.0-13.6 fl oz	12	7	Do not make more than 2 applications per crop cycle. IGR targets immatures.

Table 10.8. Insecticides approved for managing insect pests of parsley. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.

Pest	MOA Code ¹	Trade Name Active Ingredient	Rate Product/acre	REI hours	Days to Harvest	Notes
Stink bugs	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 0.63-2.5 lb XLR; 4F: 0.5-2.0 qt	12	14	Do not apply more than a total of 7.5 lb or 6 qt per acre per crop. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	3A	*Mustang (zeta-cypermethrin)	2.4-4.3 oz	12	1	A maximum of 0.3 lb ai/acre per season may be applied. Do not make applications less than 7 days apart.
	4A	Scorpion 35 SL insecticide (dinotefuran)	Foliar: 2-5.25 fl oz Soil: 9-10.5 fl oz	12	foliar - 7, soil - 21	No more than 2 applications at highest rate per acre per season. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	4A	Venom Insecticide (dinotefuran)	foliar: 1-3 oz; soil: 5-6.0 oz	12	foliar: 7; soil: 21	Use only one application method (soil or foliar, not both). Do not apply more than 6 oz/acre (foliar) or 12 oz/acre (soil) per season. Highly toxic to bees. Do not allow drift to weeds or nearby crops in bloom.
	--	Aza-Direct (azadirachtin)	1-2 pts, to 3.5 pts if needed	4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed.

¹ Mode of Action (MOA) codes for plant pest insecticides from the Insecticide Resistance Action Committee (IRAC) Mode of Action Classification v. 7.3, February 2014. Number codes (1 through 28) are used to distinguish the main insecticide mode of action groups, with additional letters for certain sub-groups within each main group. All insecticides within the same group (with same number) indicate same active ingredient or similar mode of action. This information must be considered for the insecticide resistance management decisions. un = 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 the University of Florida Cooperative Extension Service 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 10.9. Celery fungicides ordered by disease and then FRAC group according to their mode of action.

Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 18.1 for biopesticide and other alternative products labeled for disease management.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
Alternaria	7	Endura (boscalid)	9 oz	18 oz	0	0.5	Alternate with non-FRAC code 7 fungicide.
Botrytis							
Sclerotinia	7	Fontelis (penthiopyrad)	24 fl oz	72 fl oz	3	0.5	Alternate with non-FRAC code 7 fungicide.
Bacterial blight	M1	(copper compounds) Many labels available: Badge SC, Badge X2, Basic Copper 53, COCS WDG, Champ DP, Champ WG, Champ Formula 2, Champ WP, Champion++, COC DF, COC WP, Copper Count N, Cuprofix Ultra, Cuproxat, Cuerva, Kentan DF, Kocide DF, Kocide 2000, Kocide 3000, Kocide 4.5 LF, Kop-hydroxide, Mastercop, Nordox 75 WG, NuCop 50WP, NuCop 3L, NuCop HB, NuCop DF, Stretch, Tenn-Cop 5E, Top Cop w/ Sulfur	-	-	1		Varies by product from 4 hr to 2 day
	25	Agri-mycin 17 Bac-Master Firewall 17 WP (streptomycin)		200 ppm		0.5	See label for details. For transplant production.
Early blight (Cercospora)	M2	(sulfur) Many labels available: Cosavet, Crusade DF, Dusting Sulfur – IAP, Kumulus DF, Micro Sulf, Microfine Sulfur, Microthiol Disperss, Sulfur 90W, Super-Six, Top Cop w/ Sulfur	SEE INDIVIDUAL LABELS		1	1	Do not apply during periods of warm weather. Do not apply within 2 weeks of an oil spray.

Table 10.9. Celery fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 18.1 for biopesticide and other alternative products labeled for disease management.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
	M5	(chlorothalonil) Many labels available: Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720 SC, Echo 720, Echo 90DF, Echo ZN, Equus 500 ZN, Equus 720SST, Equus DF, Initiate 720, Initiate ZN	SEE INDIVIDUAL LABELS		7	0.5	
	M5 & 33	Catamaran (chlorothalonil + phosphite)	4 pt	60 pt	7	0.5	
	7 & 11	Merivon SC (pyraclostrobin & fluxapyroxad)	11.0 fl oz	33 fl oz	1	0.5	Alternate with fungicides of dissimilar modes of action
	11	Aftershock (fluoxastrobin)	5.7 fl oz	22.8 fl oz	3	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
	11	Evito 480SC (fluoxastrobin)	5.7 fl oz	22.8 fl oz	3	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
	11	Flint (trifloxystrobin)	3 oz	12 oz	7	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
	11	Gem 500SC (trifloxystrobin)	2.9 fl oz	11.6 fl oz	7	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
	11 & M5	Quadris Opti (azoxystrobin + chlorothalonil)	3.7 pt	22.2 pt	7	0.5	Do not exceed 2 sequential and 6 total appl. of Quadris Opti. or rotate with non QoI fungicides.
	11 & 3	Quilt (azoxystrobin + propiconazole)	14 fl oz	56 fl oz	14	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
	11 & 3	Quilt XCEL (azoxystrobin + propiconazole)	14 fl oz	56 fl oz	14	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
	27 & 11	Tanos (cymoxanil + famoxadone)	8 oz	72 oz	3	0.5	Do not alternate or tank mix with another FRAC group 11 fungicide.
Late blight (Septoria)	M2	(sulfur) Many labels available: Cosavet, Dusting Sulfur – IAP, Kumulus DF, Micro Sulf, Microfine Sulfur, Microthiol Disperss, Sulfur 90W, Super-Six, Top Cop w/ Sulfur	SEE INDIVIDUAL LABELS		1	1	Do not apply during periods of warm weather. Do not apply within 2 weeks of an oil spray.
	M5	(chlorothalonil) Many labels available: Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720 SC, Echo 720, Echo 90DF, Echo ZN, Equus 500 ZN, Equus 720SST, Equus DF, Initiate 720, Initiate ZN	SEE INDIVIDUAL LABELS		7	0.5	
	M5/33	Catamaran (chlorothalonil + phosphite)	4 pt	60 pt	7	0.5	
	27 & 11	Tanos (cymoxanil + famoxadone)	8 oz	72 oz	3	0.5	Do not alternate or tank mix with another FRAC group 11 fungicide.
	3	(propiconazole) Many labels available: Amtide Propiconazole, Bumper 41.8EC, Fitness, Propicure, Propi-Star EC, Propimax EC, Shar-Shield PPZ, Tilt 3.6E, Topaz	4 fl oz	16 fl oz	14	0.5	Do not exceed 4 total appls.

Table 10.9. Celery fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 18.1 for biopesticide and other alternative products labeled for disease management.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
	7	Fontelis (penthiopyrad)	24 fl oz	72 fl oz	3	0.5	Alternate with non-FRAC code 7 fungicide. See label for directions.
	7 & 11	Merivon SC (pyraclostrobin & fluxapyroxad)	11.0 fl oz	33 fl oz	1	0.5	Alternate with fungicides of dissimilar modes of action
	11	Aftershock (fluoxastrobin)	5.7 fl oz	22.8 fl oz	3	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
	11	Evito 480SC (fluoxastrobin)	5.7 fl oz	22.8 fl oz	3	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
	11	Reason (fenamidone)	8.2 fl oz	24.6 fl oz	2	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
	11	Flint (trifloxystrobin)	3 oz	12 oz	7	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
	11	Gem 500SC (trifloxystrobin)	2.9 fl oz	11.6 fl oz	7	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
	11 & M5	Quadris Opti (azoxystrobin + chlorothalonil)	3.7 pt	22.2 pt	7	0.5	Do not exceed 2 sequential and 6 total appl. of Quadris Opti. or rotate with non QoI fungicides.
	11 & 3	Quilt (azoxystrobin + propiconazole)	14 fl oz	56 fl oz	14	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
	11 & 3	Quilt XCEL (azoxystrobin + propiconazole)	14 fl oz	56 fl oz	14	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
Pink rot (Sclerotinia)	14	Botran 75W (dichloran)	2 lb	5.33 lb	7	0.5	Direct spray to base of plant.
Powdery mildew	M2	(sulfur) Many labels available: Cosavet, Crusade DF, Dusting Sulfur – IAP, Kumulus DF, Micro Sulf, Microfine Sulfur, Microthiol Disperss, Sulfur 90W, Super-Six, Top Cop w/ Sulfur	SEE INDIVIDUAL LABELS		1	1	Do not apply during periods of warm weather. Do not apply within 2 weeks of an oil spray.
Pythium	33	Aliette WDG Legion 80WDG Linebacker WDG (fosetyl-AI)	5 lb 5 lb 5 lb	20 lb 20 lb 20 lb		0.5 0.5 0.5	
Pythium seedling blight	4	Apron XL LS (mefenoxam)	0.64 fl. oz./ 100 lb seed			2	Seed treatment only.
	4	Metastar 2E AG (metalaxy)	8 pt			2	Apply as a broadcast soil application and incorporate into top 2 inches. See label for directions.
Pythium seedling diseases	4	Ridomil Gold EC (mefenoxam)	2 pt			2	Apply at seeding in a 7-12" band on soil over seed furrow.
	4	Ridomil Gold GR (mefenoxam)	40 lb			2	See label for specifics regarding preplant incorporated applications and surface applications at the time of planting.

Table 10.9. Celery fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical.

Refer to Table 18.1 for biopesticide and other alternative products labeled for disease management.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
	4	Ultra Flourish (mefenoxam)	4 pt			2	See label for specifics regarding preplant incorporated applications and surface applications at the time of planting.
Stalk rot (Rhizoctonia)	M5	(chlorothalonil) Many labels available: Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720 SC, Echo 720, Echo 90DF, Echo ZN, Equus 500 ZN, Equus 720SST, Equus DF, Initiate 720, Initiate ZN	SEE INDIVIDUAL LABELS		7	0.5	
	3	(propiconazole) Many labels available: Amtide Propiconazole, Bumper 41.8EC, Propi-Star EC, Propimax EC, Shar-Shield PPZ, Tilt 3.6E	4 fl oz	16 fl oz	14	0.5	Do not exceed 4 total appls.
	7 & 11	Merivon SC (pyraclostrobin & fluxapyroxad)	11.0 fl oz	33 fl oz	1	0.5	Alternate with fungicides of dissimilar modes of action
	11	Aftershock (fluoxastrobin)	5.7 fl oz	22.8 fl oz	3	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
	11	Evito 480SC (fluoxastrobin)	5.7 fl oz	22.8 fl oz	3	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
	11	Flint (trifloxystrobin)	3 oz	12 oz	7	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
	11	Gem 500SC (trifloxystrobin)	2.9 fl oz	11.6 fl oz	7	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
	11 & M5	Quadris Opti (azoxystrobin + chlorothalonil)	3.7 pt	22.2 pt	7	0.5	Do not exceed 2 sequential and 6 total appl. of Quadris Opti. or rotate with non QoI fungicides.
Various	7 & 11	Merivon SC (pyraclostrobin & fluxapyroxad)	11.0 fl oz	33 fl oz	1	0.5	Alternate with fungicides of dissimilar modes of action
	11	Cabrio EG (pyraclostrobin)	16oz	64 oz	0	0.5	Do not exceed 1 sequential appl. of QoI fungicides. See label for soil appl.
	11	Quadris, Satori, Willowood Azoxy (azoxystrobin)	15.4 fl oz or 0.8 fl oz/1000 row ft	2.88 qt	0	4 hr	Do not exceed 1 sequential appl. of QoI fungicides. See label for soil appl.
	19	OSO 5%SC (polyoxin D zinc salt)	13 fl oz	84 fl oz	0	4 hr	See label for details.
	33	(mono- and di-potassium salts of phosphorous acid) Many brands available: Alude, Confine Extra, Fosiphite, Fungi-phite, K-Phite, Oxiphos, Phiticide, Phostrol, Prophyt, Rampart, Reveille	3 qt		0	4 hr	See label for details.

Table 10.9. Celery fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 18.1 for biopesticide and other alternative products labeled for disease management.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
Various seedling diseases	12	Maxim 4FS (fludioxonil)	0.16 fl oz/ 100 lb of seed			0.5	Seed treatment only.
	4 & 11	Uniform SC (mefenoxam + azoxystrobin)	0.34 fl oz/ 1000' of row	1 appl.		0	Soil incorporated.

¹FRAC code (fungicide group): Number (1 through 46) and letters (U and P) are used to distinguish the fungicide mode of action groups. All fungicides within the same group (with same number or letter) indicate same active ingredient or similar mode of action. This information must be considered for the fungicide resistance management decisions. U = unknown, or a mode of action that has not been classified yet and is typically associated with another number; P = host plant defense inducers. Source: FRAC Code List 2013; <http://www.frac.info/> (FRAC = Fungicide Resistance Action Committee).

²Information 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 the University of Florida Cooperative Extension Service nor discrimination against similar products or services not mentioned.

Table 10.10. Okra fungicides ordered by disease and then FRAC group according to their mode of action.

Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 18.1 for biopesticide and other alternative products labeled for disease management.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
Anthracnose	M1	Champion++	1.75 lb	17.5 lb	0	48 hr	
		Kentan DF	1.5 lb		0	2	
		Kocide 2000	3 lb	15 lb	0	2	
		Kocide 3000	1.75 lb	17.5 lb	0	2	
		Nu-Cop 50DF (copper hydroxide)	2.1 lb	10.5 lb	1	2	OMRI product
	M1	Mastercop (copper sulfate pentahydrate)	1.5 pt	9 pt	0	2	
	M5	Bravo Ultrex	1.4 lb	10.9 lb	3	0.5	
		Bravo Weather Stik	1.5 pt	12 pt	3	0.5	
		Chloronil 720	1.5 pt	12 pt	3	0.5	
		Echo 720	1.5 pt	12 pt	3	0.5	
Equus 720 SST (chlorothalonil)		1.5 pt	12 pt	3	0.5	Do not apply at < 7-day intervals.	
M5 & 27	Ariston (chlorothalonil + cymoxanil)	2.44 pt	18.1 pt	3			
3	Topguard (flutriafol)	14 fl oz	56 fl oz	0	12 hr		
3 & 9	Inspire Super (difenoconazole + cyprodinil)	20 fl oz	80 fl oz	7	0.5	Do not apply more than 2 sequential applications	
7	Fontelis (penthiopyrad)	24 fl oz	72 fl oz	0		Only suppression; make no more than 2 sequential applications	
11	Equation	15.5 fl oz	61.5 fl oz	0	4 hr	Adjuvant may be added.	
	Equation SC	15.5 fl oz	61.5 fl oz	0	4 hr	Adjuvant may be added.	
	Quadris	15.5 fl oz	61.5 fl oz	0	4 hr		
	Satori Fungicide	15.5 fl oz	61.5 fl oz	0	4 hr	Do not apply more than 1 application	
	Willowood Azoxy 2SC (azoxystrobin)	15.5 fl oz	61.5 fl oz	0	4 hr		

Table 10.10. Okra fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 18.1 for biopesticide and other alternative products labeled for disease management.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²	
			Applic.	Season	Harvest	Reentry		
	11 & 3	Quadris Top (azoxystrobin + difenoconazole)	14 fl oz	55.3 fl oz	0	0.5	Make no more than 2 consecutive applications	
	33	K-Phite 7LP AG (phosphorous acid)	see label		0	4 hr	Do not apply at intervals less than 3 days.	
Bacterial leaf spot	M1	Champion++	1.75 lb	17.5 lb	0	48 hr		
		Kentan DF	1.5 lb		0	2		
		Kocide 2000	3 lb	15 lb	0	2		
		Kocide 3000	1.75 lb	17.5 lb	0	2		
		Nu-Cop 50 DF (copper hydroxide)	2.1 lb	10.5 lb	1	2	OMRI product	
	M1	Mastercop (copper sulfate pentahydrate)	1.5 pt	9 pt	0	2		
Cercospora leaf spot	3	Monsoon	6 fl oz	24 fl oz	3	2	Group 3 = DMI fungicide	
		Onset 3.6L	6 fl oz	24 fl oz	7	0.5		
		Orius 3.6F	6 fl oz	24 fl oz	3	0.5		
		Tebu-Crop 3.6F	6 fl oz	24 fl oz	3	0.5		
		TebuStar 3.6L	6 fl oz	24 fl oz	3	0.5		
		Tebucon 3.6F	6 fl oz	24 fl oz	3	0.5		
		Topguard (tebuconazole)	14 fl oz	56 fl oz	0	0.5		
	11 & 3	Quadris Top (azoxystrobin + difenoconazole)	14 fl oz	55.3 fl oz	0	0.5	Do not make 2 consecutive applications	
	M5	Bravo Ultrex	1.4 lb	10.9 lb	3	0.5	Do not apply at < 7-day intervals.	
		Bravo Weather Stik	1.5 pt	12 pt	3	0.5		
		Chloronil 720	1.5 pt	12 pt	3	0.5		
		Echo 720	1.5 pt	9.0 lb a.i.	3	0.5		
		Equus 720 SST (chlorothalonil)	1.5 pt	12 pt	3	0.5		
	M2 & 3	Unicorn DF (sulfur; tebuconazole)	3.75 lb	15 lb	14	0.5	Do not mix with other DMI fungicides (Group 3)	
	M5 & 27	Ariston (chlorothalonil; cymoxanil)	2.44 pt	18.1 pt	3	0.5		
Leaf spot	M1	Champion++	1.75 lb	17.5 lb	0	48 hr	OMRI product	
		Kentan DF	1.5 lb		0	2		
		Kocide 2000	3 lb	15 lb	0	2		
		Kocide 3000	1.75 lb	17.5 lb	0	2		
		Nu-Cop 50DF (copper hydroxide)	2.1 lb	10.5 lb	1	2		
		M1	Mastercop (copper sulfate pentahydrate)	1.5 pt	9 pt	0	2	
		M2	Cosavet DF	10 lb	-	-	1	OMRI product
	Microthiol-Disperss		10 lb	-	-	1	May cause leaf burn if applied during high temperatures	
		Thiolux (sulfur)	10 lb			1	Apply at 14-day intervals	
Pod spot	M1	Champion++	1.75 lb	17.5 lb	0	48 hr	OMRI product	
		Kentan DF	1.5 lb		0	2		
		Kocide 2000	3 lb	15 lb	0	2		
		Kocide 3000	1.75 lb	17.5 lb	0	2		
		Nu-Cop 50DF (copper hydroxide)	2.1 lb	10.5 lb	1	2		
		M1	Mastercop (copper sulfate pentahydrate)	1.5 pt	9 pt	0	2	

Table 10.10. Okra fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 18.1 for biopesticide and other alternative products labeled for disease management.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
Powdery mildew	M1	Champion++	1.75 lb	17.5 lb	0	48 hr	
		Kentan DF	1.5 lb		0	2	
		Kocide 2000	3 lb	15 lb	0	2	
		Kocide 3000	1.75 lb	17.5 lb	0	2	
		Nu-Cop 50DF (copper hydroxide)	2.1 lb	10.5 lb	1	2	OMRI product
	M1	Mastercop (copper sulfate pentahydrate)	1.5 pt	9 pt	0	2	
	M2	Cosavet DF	10 lb	-	-	1	May cause leaf burn if applied during high temperatures
		Micro Sulf	10 lb			1	
		Microthiol-Disperss	10 lb	-	-	1	
		Suffa	0.5 gal			1	
		Thiolux (sulfur)	10 lb			1	
	M5	Bravo Ultrex	1.4 lb	10.9 lb	3	0.5	Do not apply at < 7-day intervals.
		Bravo Weather Stik	1.5 pt	12 pt	3	0.5	
		Chloronil 720	1.5 pt	12 pt	3	0.5	
		Echo 720	1.5 pt	9.0 lb a.i.	3	0.5	
		Equus 720 SST (chlorothalonil)	1.5 pt	12 pt	3	0.5	
	P5	Regalia (extract of Reynoutria sachalinensis)	see label		0	4 hr	
	U8	Vivando (metrafenone)	15.4 fl oz	46.2 fl oz	0	0.5	
	3	Rally (myclobutanol)	5.0 oz	1.25 lb	0	1	Do not exceed 4 applications per season.
	3	Sonoma 40WSP (myclobutanol)	5 oz	20 oz	0	1	Do not make more than 4 applications per season.
	3	Topguard (flutriafol)	14 fl oz	56 fl oz	0	12 hr	
	7	Fontelis (penthiopyrad)	24 fl oz	72 fl oz	0		
	11	Equation	15.5 fl oz	61.5 fl oz	0	4 hr	Adjuvant may be added.
Equation SC		15.5 fl oz	61.5 fl oz	0	4 hr	Adjuvant may be added.	
Quadris		15.5 fl oz	61.5 fl oz	0	4 hr		
11	Reason (fenamidone)	8.2 fl oz	24.6 fl oz	14	0.5	See label for details.	
	Satori Fungicide	15.5 fl oz	61.5 fl oz	0	4 hr	Do not apply more than 1 application	
	Willowood Azoxy 2SC (azoxystrobin)	15.5 fl oz	61.5 fl oz	0	4 hr		
33	Fosphite Fungicide (potassium phosphite)	3 qt		0	4 hr	Do not apply at intervals less than 3 days.	
	Rampart	3 qt		0	4 hr		
	K-Phite 7LP AG (phosphorous acid)	see label		0	4 hr		
3 & 9	Inspire Super (difenoconazole + cyprodinil)	20 fl oz	80 fl oz	7	0.5	Do not apply more than 2 sequential applications	
11 & 3	Quadris Top (azoxystrobin + difenoconazole)	14 fl oz	55.3 fl oz	0	0.5	Do not make 2 consecutive applications	
9 & 12	Switch 62.5WG (cyprodinil; fludioxonil)	14 oz	56 oz	0	0.5	After 2 applications, alternate with another fungicide with a different mode of action for 2 applications.	

Table 10.10. Okra fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 18.1 for biopesticide and other alternative products labeled for disease management.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
Phytophthora damping-off	4	Acquire	0.75 fl oz/ 100 lb seed			1	
		Allegiance FL	0.75 fl oz/ 100 lb seed	-	-	1	Seed treatment; Do not use with other seed treatment products without previous experience.
		Allegiance LS	1.2 fl oz/ 100 lb seed			1	
		Metastar ST Seed Treatment	0.75 fl oz/ 100 lb seed			1	
		Serbing 318 FS	0.75 fl oz/ 100 lb seed			1	
		Serbing 480 FS	0.50 fl oz/ 100 lb seed			1	
	(metalaxy)						
	4	Apron XL (mefenoxam)	0.64 fl oz/ 100 lb seed			2	Seed treatment only.
	4	Orondis Gold B (mefanoxam)	2.0 pt	2.0 pt	7	2	Do not make more than 1 soil application per crop.
	21	Ranman (cyazofamid)	2.75 fl oz	16.75 fl oz	7	0.5	Do not exceed 6 applications per season. Rotate with dissimilar modes of action.
33	Alude	2 qt			4 hr	Foliar spray	
	Fosphite Fungicide	See label		0	4 hr	Do not apply at intervals less than 3 days.	
	Rampart (potassium phosphite)	See label		0	4 hr		
40	Orondis Ultra B (mandipropamid)	8 fl oz	32 fl oz	1	0.5	Do not exceed 4 applications. Do not make more than 2 sequential applications. Do not exceed more than 33% of total foliar applications.	
U15	Orondis Gold A (oxathiaprolin)	19.2 fl oz	38.6 fl oz	2	4 hr	Intended for use with Orondis Gold B (mefenoxam). See label for details. Do not exceed 4 applications. Do not use soil and foliar appl with oxathiaprolin during same season. Check plant back restrictions.	
U15	Orondis Ultra A (oxathiaprolin)	4.8 fl oz	19.2 fl oz	0	4 hr	Intended for use with Orondis Ultra B (mandipropamid). See label for details. Do not exceed 4 applications. Do not use soil and foliar appl with oxathiaprolin during same season. Check plant back restrictions.	
U15	Orondis Opti A (oxathiaprolin)	4.8 fl oz	19.2 fl oz	0	4 hr	Intended for use with Orondis Opti B (chlorothalonil). See label for details. Do not exceed 4 applications. Check plant back restrictions.	

Table 10.10. Okra fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 18.1 for biopesticide and other alternative products labeled for disease management.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
Pythium damping-off	4	Acquire	0.75 fl oz/ 100 lb seed			1	
		Allegiance FL	0.75 fl oz/ 100 lb seed	-	-	1	Seed treatment; Do not use with other seed treatment products without previous experience.
		Allegiance LS	1.2 fl oz/ 100 lb seed			1	
		Metastar ST Seed Treatment	0.75 fl oz/ 100 lb seed			1	
		Serbing 318 FS	0.75 fl oz/ 100 lb seed			1	
		Serbing 480 FS	0.50 fl oz/ 100 lb seed			1	
		(metalaxyl)					
4	Apron XL (mefenoxam)	0.64 fl oz/ 100 lb seed			2	Seed treatment only.	
Pythium damping-off	33	Alude	2 qt			4 hr	Foliar spray
		Fosphite Fungicide	see label		0	4 hr	Do not apply at intervals less than 3 days.
		Fungi-Phite	See label			4 hr	
		Rampart (potassium phosphite)	See label		0	4 hr	
Rhizoctonia seedling rot	11	Quadris	0.8 fl oz/ 1000 row feet	61.5 fl oz	0	4 hr	
		Satori Fungicide (azoxystrobin)					
		33	Fosphite Fungicide	see label		0	4 hr
Fungi-Phite	See label			4 hr			
Rampart (potassium phosphite)	See label		0	4 hr			

¹ FRAC code (fungicide group): Number (1 through 46) and letters (U and P) are used to distinguish the fungicide mode of action groups. All fungicides within the same group (with same number or letter) indicate same active ingredient or similar mode of action. This information must be considered for the fungicide resistance management decisions. U = unknown, or a mode of action that has not been classified yet and is typically associated with another number; P = host plant defense inducers. Source: FRAC Code List 2013; <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 the University of Florida Cooperative Extension Service nor discrimination against similar products or services not mentioned.

Table 10.10. Parsley fungicides ordered by disease and then FRAC group according to their mode of action.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
Alternaria	3	(propiconazole) Many brands available: Bumper 41.8EC, Propi-star, Tilt, Topaz	4 fl oz	16 fl oz	14	0.5	Do not apply more than 2 sequential and 4 total applications
	3	Procure 480SC (triflumizole)	8 fl oz	18 fl oz	0	0.5	Repeat applications at 14 day intervals.
	7	Fontelis 1.67SC (penthiopyrad)	24 fl oz	72 fl oz	3	0.5	
	7 & 11	Merivon SC (pyraclostrobin & fluxapyroxad)	11 fl oz	33 fl oz	1	0.5	Alternate with fungicides with dissimilar modes of action.
	9 & 12	Switch 62.5WDG (cyprodinil + fludioxonil)	14 oz	56 oz	7	0.5	
Bacterial blight	M1	(copper compounds) Many brands available: Badge SC, Badge X2, Basic Copper 53, COCS WDG, Champ DP, Champ WG, Champ Formula 2, Champ WP, COC DF, COC WP, Copper Count N, Cuerva, Cuprofix Ultra, Cuproxat, Kentan DF, Kocide DF, Kocide 2000, Kocide 3000, Kocide 4.5 LF, Kop-hydroxide, Nordox 75 WG, NuCop 50WP, NuCop 3L, NuCop HB, NuCop DF, Stretch	SEE INDIVIDUAL LABELS		1	Varies by product from 4 hr to 2 day	
Basal rot & Botrytis	12	Cannonball WP (fludioxonil)	7 oz	28 oz	0	0.5	
Cercospora	3	Bumper 41.8EC (propiconazole)	4 fl oz	16 fl oz	14	0.5	Do not apply more than 2 sequential appl. Without alternating to different mode of action
	7 & 11	Merivon SC (pyraclostrobin & fluxapyroxad)	11 fl oz	33 fl oz	1	0.5	Alternate with fungicides with dissimilar modes of action.
Damping-off	33	Aliette WDG	5 lb	35 lb		0.5	
		Legion 80WDG	5 lb	35 lb		0.5	
		Linebacker WDG (fosetyl-AI)	5 lb	35 lb		0.5	
Downy mildew	21	Ranman SC (cyazofamid)	2.75 fl oz	16.5 fl oz	0	0.5	Alternate with fungicides with dissimilar modes of action.
	33	(mono- and di-potassium salts of phosphorous acid) Many brands available: Alude, Fosphite, Fungi-phite, K-phite, Phiticide, Phostrol, Rampart, Reveille	3 qt		0	0.5	See label for details.
	40	Forum (dimethomorph)	6 fl oz	18 fl oz	0	0.5	See label for details.
	40	Revus (mandipropamid)	8 fl oz	32 fl oz	1	4 hr	Do not exceed 2 sequential applications. See label for soil applications.
	40 + 45	Zampro (mandipropamid)	14 fl oz	42 fl oz	1	4 hr	Do not exceed 2 sequential applications.
	43	Presidio (fluopicolide)	3-4 fl oz	12 fl oz	2	0.5	Must be tank-mixed with a fungicide of different mode of action. Do not exceed two sequential applications. See label for soil applications.
Powdery mildew	M2	(sulfur) Many brands available: Sulfur 90W, Super Six, Top Cop w/ Sulfur	SEE INDIVIDUAL LABELS		1	1	Do not apply during periods of warm weather. Do not apply within 2 weeks of an oil spray.

Table 10.10. Parsley fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical.

Refer to Table 18.1 for biopesticide and other alternative products labeled for disease management.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
	3	Bumper 41.8EC (propiconazole)	4 fl oz	16 fl oz	14	0.5	Do not apply more than 2 sequential appl. Without alternating to different mode of action
	3	Tilt 3.6E (propiconazole)	4 fl oz	16 fl oz	14	0.5	Do not exceed 2 sequential and 4 total applications.
	3	Procuire 480SC (triflumizole)	8 fl oz	18 fl oz	0	0.5	Repeat applications at 14 day intervals.
	7 & 11	Merivon SC (pyraclostrobin & fluxapyroxad)	11 fl oz	33 fl oz	1	0.5	Alternate with fungicides with dissimilar modes of action.
	9 & 12	Switch 62.5WDG (cyprodinil + fludioxonil)	14 oz	56 oz	7	0.5	
Pythium damping-off; Pythium seedling blight; Pythium seedling diseases	4	(metalaxyl) Various brands available: Acquire, Allegiance, Sebring 2.65ST	0.75 fl oz/ 100 lb seed			2	Seed treatment only.
	4	Apron XL LS (mefenoxam)	0.64 fl. oz./ 100 lb seed			2	Seed treatment only.
	4	Ridomil Gold EC (mefenoxam)	2 pt			2	Apply at seeding in a 7-12" band on soil over seed furrow.
	4	Ridomil Gold GR (mefenoxam)	40 lb			2	See label for specifics regarding preplant incorporated applications and surface applications at the time of planting.
	4	Ultra Flourish	4 pt			2	See label for specifics regarding preplant incorporated applications and surface applications at the time of planting.
Septoria	3	Tilt 3.6E (propiconazole)	4 fl oz	16 fl oz	14	0.5	Do not exceed 2 sequential and 4 total applications.
	7	Fontelis 1.67SC (penthiopyrad) (pyraclostrobin & fluxapyroxad) (penthiopyrad) (pyraclostrobin & fluxapyroxad)	24 fl oz	72 fl oz	3	0.5	
	11	Cabrio EG (pyraclostrobin)	16oz	64 oz	0	0.5	Do not exceed 1 sequential and 4 total appl. of QoI fungicides.
	11	(azoxystrobin) Various brands available: Azoxystrobin, Equation, Quadris, Satori, Willowood	15.4 fl oz or 0.8 fl oz/ 1000 row ft	92.3 fl oz	0	4 hr	Do not exceed 1 sequential and 4 total appl. of QoI fungicides. See label for soil appl.
	11	Reason (fenamidone)	8.2 fl oz	24.6 fl oz	2	0.5	Alternate every other application with a fungicide of dissimilar mode of action.
Various seedling diseases	12	Maxim 4FS (fludioxonil)	0.16 fl oz/ 100 lb of seed			0.5	Seed treatment only.
	4 & 11	Uniform SC (mefenoxam + azoxystrobin)	0.34 fl oz/ 1000 ft of row	1 appl.		0	Soil incorporated.

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