

Melon: muskmelon (cantaloupe), watermelon

Planting

Melons need a long growing season of relatively high temperatures (averaging 70–80°F) for optimal growth. Vine crops are susceptible to frost, and seeds will not germinate in soils colder than 60°F. Planting generally begins around May 10 in southern Wisconsin and June 1 in northern Wisconsin.

Use tillage practices that create a level, firm seedbed with adequate moisture for germination. Melons grown on sandy soil will need irrigation.

Muskmelon

Rows: 60–84 inches.

Plants in row: 8–12 inches apart.

Watermelon

Rows: 60–96 inches.

Plants in row: 36–96 inches apart.

Transplants can and often should be used to start plantings. Vine crops are sensitive to transplanting and should be seeded in individual containers about 3–4 weeks before putting in the field. Move plants to the field starting around May 20 in southern Wisconsin and June 1 in northern Wisconsin. Vine crops do well when grown on black plastic mulch or under floating row covers in spring and early summer.

Lime and fertilizer

Lime: Use dolomitic limestone to maintain a pH of 5.8 on mineral soils and 5.6 on organic soils.

Fertilizer rates: Apply P_2O_5 and K_2O according to soil test recommendations. Use annual nitrogen, P_2O_5 , and K_2O recommendations in the table below. Take credits for previous legume crops and manure.

Application: Broadcast lime and fertilizer and work into the soil before planting. Apply fertilizer at planting time in a band 2 inches to the side and 2 inches below seed level.

Nitrogen: Split nitrogen recommendation into two or more applications during the season. Make the first application when plants have two or more true leaves. Make a second application when vines begin to fill the rows. Subsequent applications (15–20 lb N/a each) can be made at 10- to 14-day intervals after harvest has started.

Annual nitrogen, phosphate, and potash recommendations for melon

Nitrogen		Phosphate and potash		
Organic matter (%)	Amount to apply (lb/a)	Yield goal (t/a)	Amount P_2O_5 to apply* (lb/a)	Amount K_2O to apply* (lb/a)
<2	100	8–10	40	145
2.0–9.9	80			
10–20	60			
>20	30			

*Amounts shown are for optimum (O) soil test levels. Apply 50% of this rate if soil test is high (H) and omit if soil test is excessively high (EH). If soil test is low (L) or very low (VL), increase rates according to soil test recommendations.

Eggplant

Hops

Horseradish

Leafy greens

Melon

Mint

Onion

Disease management

Try to grow crop under ideal conditions for fertility, soil texture, soil moisture, and pH. Use disease-free seed. Avoid fruit injury. Rotate crops with non-cucurbits

and eradicate cucurbit weeds. Follow a 7-day fungicide spray schedule, starting before the disease occurs. Apply

the selected fungicide in at least 50 gal water/a when using ground equipment or in 5–10 gal water/a with aerial application.

Disease control in melon—muskmelon, watermelon

Disease	Active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Alternaria leaf blight	azoxystrobin	10.0–15.5 fl oz Equation, Quadris Flowable, Satori 11.0–15.5 fl oz Aframe	1 1	Equation, Quadris, Satori, Reason, and Cabrio belong to the Group 11 (strobilurin) fungicide category. Quadris Opti contains Groups 11 and M5 fungicides. Tanos contains Groups 11 and 27 fungicides. Do not exceed 1 application of any of these products before alternating with a fungicide having a different mode of action. Do not exceed 4 applications of strobilurin fungicides per crop per year. Do not apply more than 26.0 oz/a Endura per year. Do not make more than 4 applications per year. Pristine belongs to Groups 7 and 11 fungicide categories. Do not exceed 1 application of Pristine before alternating to a labeled fungicide with a different mode of action and not belonging to Groups 7 or 11. Do not exceed 4 applications of Pristine or other Group 7 or Group 11 fungicides per season. Do not exceed 74.0 oz/a Pristine per season. Consult label directions, especially for use on watermelons. Application can result in sunburn on surface of fruit.
	azoxystrobin + chlorothalonil	3.2 pt Quadris Opti	1	
	azoxystrobin + difenoconazole	12.0–14.0 fl oz Quadris Top	1	
	cymoxanil + famoxadone	8.0 oz Tanos 50DF	3	
	fenamidone	5.5 fl oz Reason 500 SC	14	
	pyraclostrobin	12.0–16.0 oz Cabrio EG	0	
	boscalid	6.5 oz Endura	0	
	boscalid + pyraclostrobin	12.5–18.5 oz Pristine WDG	0	
	chlorothalonil	2.0–3.0 pt Bravo Weather Stik, Equus 720 1.8–2.7 lb Bravo Ultrex 82.5WDG, Equus DF	0 0	
	cyprodinil + difenoconazole	16.0–20.0 fl oz Inspire Super	7	
cyprodinil + fludioxonil	11.0–14.0 oz Switch 62.5WG	1		
fluopyram + tebuconazole	8.0–17.0 fl oz Luna Experience	7		
fluopyram + trifloxystrobin	7.6 fl oz Luna Sensation	0		
fluoxastrobin	3.0–5.7 fl oz Evito 480 SC	1		
fluxapyroxad + pyraclostrobin	4.0–5.5 fl oz Merivon	0		

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Disease control in melon—muskmelon, watermelon *(continued)*

Disease	Active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions	
Alternaria leaf blight <i>(cont.)</i>	hydrogen dioxide	1:100–1:2000 dilution rate OxiDate	0	Root and cutting dip treatment, soil drench, and seed treatments are registered. See label for application details. Follow tank-mixing instructions on label; some incompatibility issues exist. See cucurbit section of label for further details among crop grouping. Allowable for use in organic systems.	
	mancozeb	1.2–2.4 qt Penncozeb 4FL	5	Consult label for seasonal product limits. Apply when conditions favor disease. Use higher rates and shorter intervals when disease pressure is high.	
		1.6–2.4 qt Dithane F-45, Manzate Flowable	5		
		2.0–3.0 lb Dithane DF Rainshield, Manzate Pro-Stick, Penncozeb 75DF, Penncozeb 80WP	5		
	mancozeb + copper hydroxide	2.0–3.0 lb ManKocide	5	Do not make more than 8 applications/a per year. Follow seasonal limits for EBDC usage.	
	penthiopyrad	12.0–16.0 fl oz Fontelis	1	Make no more than 2 sequential applications before alternating to an effective fungicide with a different mode of action. Do not exceed 67.0 fl oz/a per year. Can be used on greenhouse-grown cucumbers. See label for specific instructions on greenhouse rates.	
	zoxamide + chlorothalonil	36.0 fl oz Zing	0	Do not make more than 2 sequential applications before alternating to a fungicide of a different mode of action.	
zoxamide + mancozeb	1.5–2.0 lb Gavel 75DF	5	Do not exceed 8 applications or apply more than 16.0 lb/a Gavel (10.67 lb ai/a mancozeb and 1.33 lb ai/a zoxamide) per season.		
Anthracnose	azoxystrobin	10.0–15.5 fl oz Equation, Quadris Flowable, Satori	1	See remarks for Equation, Quadris, Satori, Tanos, and Cabrio in Alternaria leaf blight section. If disease pressure is high, use the shortest interval and highest rate.	
		11.0–15.5 fl oz Aframe	1		
	azoxystrobin + chlorothalonil	3.2 pt Quadris Opti	1		
	azoxystrobin + difenoconazole	12.0–14.0 fl oz Quadris Top	1		
	cymoxanil + famoxadone	8.0 oz Tanos 50DF	3		
	pyraclostrobin	12.0–16.0 oz Cabrio EG	0		
	boscalid + pyraclostrobin	18.5 oz Pristine WDG	0		Pristine belongs to Group 7 and 11 fungicide categories. Do not exceed 1 application of Pristine before alternating to a labeled fungicide with a different mode of action. Do not exceed 4 applications of Pristine or other Group 7 or Group 11 fungicides per season. Do not exceed 74.0 oz/a Pristine per season.
	chlorothalonil	1.5–2.0 pt Bravo Weather Stik, Echo 720	0		
		1.4–1.8 lb Bravo Ultrex 82.5WDG	0		
		1.25–1.625 lb Echo 90DF	0		
cyprodinil + difenoconazole	16.0–20.0 fl oz Inspire Super	7	Do not apply more than 80.0 fl oz/a per year. Make no more than 2 sequential applications before alternating to an effective fungicide with a different mode of action.		

(continued)

Eggplant

Hops

Horse radish

Leafy greens

Melon

Mint

Onion

Disease control in melon—muskmelon, watermelon *(continued)*

Disease	Active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Anthracnose <i>(cont.)</i>	fluopyram + tebuconazole	17.0 fl oz Luna Experience	7	Do not apply with aerial application equipment. Follow resistance management guidelines.
	fluopyram + trifloxystrobin	7.6 fl oz Luna Sensation	0	For watermelon only. A mild yellowing on leaf margins may be noted with Luna Sensation. Follow resistance management guidelines.
	fluoxastrobin	3.0–5.7 fl oz Evito 480 SC	1	Begin application preventively. Use higher rates when disease pressure is high. Do not tank mix with insecticides that are EC-based.
	fluxapyroxad + pyraclostrobin	5.5 fl oz Merivon	0	Do not make more than 3 applications per acre per season.
	hydrogen dioxide	1:100–1:2000 dilution rate OxiDate	0	Root and cutting dip treatment, soil drench, and seed treatments are registered. See label for application details. Follow tank-mixing instructions on label; some incompatibility issues exist. See cucurbit section of label for further details among crop grouping. Allowable for use in organic systems.
	mancozeb	1.2–2.4 qt Penncozeb 4FL 1.6–2.4 qt Dithane F-45, Manzate Flowable 2.0–3.0 lb Dithane DF Rainshield, Koverall, Manzate Pro-Stick, Penncozeb 75DF, Penncozeb 80WP	5	Do not apply more than 24.0 lb/a per year. Consult label for seasonal product limitations.
			5	
			5	
	mancozeb + copper hydroxide	2.0–3.0 lb ManKocide	5	Do not make more than 8 applications/a per year. Follow label allowance guidelines for EBDC usage.
thiophanate methyl	0.5 lb Topsin M 70W, Topsin M WSB 10.0 fl oz Topsin 4.5FL	0	Apply when disease first appears and repeat if needed every 7–14 days. See label for resistance management guidelines. Do not apply more than 60.0 fl oz of product/a per year.	
zoxamide + chlorothalonil	36.0 fl oz Zing	0	Do not make more than 2 sequential applications before alternating to a fungicide of a different mode of action.	
Bacterial wilt <i>(Erwinia)</i>	<i>Eliminate the cucumber beetles that carry this pathogen (see Insect Control table).</i>			
Black rot	<i>See fungicide treatments recommended for anthracnose.</i> fixed copper			Use certified disease-free seed. Destroy infected plant refuse.
Downy mildew	ametoctradin + dimethomorph	14.0 fl oz Zampro	0	Begin application prior to disease development and continue on a 5- to 7-day interval. Make no more than 3 applications/a per season.
	azoxystrobin + chlorothalonil	3.2 pt Quadris Opti	1	See remarks for this product in Alternaria leaf blight section.
	boscalid + pyraclostrobin	12.5–18.5 oz Pristine WDG	0	Pristine belongs to Groups 7 and 11 fungicide categories. Do not exceed 1 application of Pristine before alternating to a labeled fungicide with a different mode of action. Do not exceed 4 applications of Pristine or other Group 7 or Group 11 fungicides per season. Do not exceed 74.0 oz/a Pristine per season.
	chlorothalonil	1.4–1.8 lb Bravo Ultrex	0	Do not apply more than 19.1 lb/a.
	chlorothalonil + cymoxanil	3.0 pt Ariston	3	Be cautious when applying to mature watermelons as treatment may result in sunburn on upper surface of fruit.

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Disease control in melon—muskmelon, watermelon *(continued)*

Disease	Active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Downy mildew <i>(cont.)</i>	cyazofamid	2.1–2.75 fl oz Ranman	0	Ranman belongs to Group 21 fungicide category. Do not apply more than six sprays of Ranman per crop. Alternate Ranman sprays with a fungicide having a different mode of action. Do not apply more than 16.5 fl oz/a per year.
	cymoxanil	3.2–5.0 oz Curzate	3	Use only with a protectant as a tank mix partner, such as chlorothalonil, mancozeb, or copper hydroxide. Do not make more than 9 applications per year.
	dimethomorph	6.0 fl oz Forum	0	Do not exceed 30.0 fl oz/a per growing season. Do not make more than 5 applications per season. Do not make more than 2 sequential applications of Forum before alternating to another effective fungicide with a different mode of action for at least one application.
	famoxadone + cymoxanil	8.0 oz Tanos	3	Do not make more than 1 application of Tanos before alternating with a fungicide having a different mode of action. Do not make more than 4 applications of Tanos or other Group 11 fungicides per season. Do not exceed 32.0 oz/a Tanos per crop per season. Tanos is helpful for suppressing Phytophthora blight. Tanos must be tank mixed with a contact fungicide such as mancozeb, chlorothalonil, or copper-containing fungicide.
	fenamidone	5.5 fl oz Reason 500 SC	14	Do not apply more than 22.0 fl oz Reason 500 SC (0.71 lb ai/a per year).
	fixed copper	1.0–1.3 pt Champ Formula 2	0	Use disease-free seed and rotate crops. Begin applications before fruit form at less than 7-day intervals. After a rain and wind storm, make two or three applications as soon as possible after the storm at 2- to 3-day intervals.
		2.6 pt Kocide LF 2.4F	0	
		0.5–1.25 lb Kocide 3000	0	
		1.0–2.25 lb Kocide 2000 DF	0	
		1.5–2.0 lb Kocide 101 77WP, Kocide DF	0	
	1.5–3.0 lb Champion 77WP	0		
	fluazinam	0.75–1.5 pt Omega 500F	30	Do not apply more than 9.0 pt/a per year. Has a long PHI for cucurbits.
	fluopicolide	3.0–4.0 fl oz Presidio	2	Tank mix this product with another labeled non-Group 43 fungicide. May be applied through irrigation.
fosetyl-al	2.0–5.0 lb Aliette WDG, Linebacker WDG	12 hr	Begin applications when conditions favor disease development (high moisture and moderate temperatures). Repeat at 7- to 14-day intervals. Do not exceed 7 applications per season.	
hydrogen dioxide	1:100–1:2000 dilution rate OxiDate	0	Root and cutting dip treatment, soil drench, and seed treatments are registered. See label for application details. Follow tank-mixing instructions on label; some incompatibility issues exist. See cucurbit section of label for further details among crop grouping. Allowable for use in organic systems.	
mancozeb	1.2–2.4 qt Penncozeb 4FL	5	Do not apply more than 24.0 lb/a per year. Consult label for seasonal product limitations.	
	1.6–2.4 qt Dithane F-45, Manzate Flowable	5		
	2.0–3.0 lb Dithane DF Rainshield, Koverall, Manzate Pro-Stick, Penncozeb 75DF, Penncozeb 80WP	5		

(continued)

Eggplant

Hops

Horse radish

Leafy greens

Melon

Mint

Onion

Disease control in melon—muskmelon, watermelon *(continued)*

Disease	Active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Downy mildew <i>(cont.)</i>	mancozeb + copper hydroxide	2.0–3.0 lb ManKocide	5	Do not make more than 8 applications per year. Some cantaloupe varieties may exhibit sensitivity to ManKocide application.
	mandipropamid	8.0 fl oz Revus	0	Do not exceed 1 application before switching to another effective non-Group 40 fungicide. Must be applied with an adjuvant.
	mefenoxam	2.5 pt Ridomil Gold Bravo SC	0	Use caution when applying to watermelon. Do not exceed 15.75 lb ai/a of chlorothalonil products or 1.0 lb ai soil-applied or 0.5 lb ai foliar-applied mefenoxam.
	mefenoxam + mancozeb	2.5 lb Ridomil Gold MZ	5	A maximum of 10.0 lb Ridomil Gold MZ may be applied per crop per season. Follow season allowance guidelines for EBDC usage.
	oxathiapiprolin	2.0–4.8 fl oz Orondis Opti A, Orondis Ultra A	0	Make no more than 2 sequential applications before rotating to a fungicide with a different mode of action. Do not exceed 19.2 fl oz/a per year. Begin foliar applications prior to disease development. Do not use Orondis Ultra A as a foliar application if you have already used Orondis Gold 200 on the soil at time of planting.
	phosphorous acid, mono- and dibasic sodium, potassium, and ammonium salts	2.5–5.0 pt Phostrol 1.0–3.0 qt Confine Extra, K-Phite/20 gal water	0	Do not exceed 7 applications per season.
	potassium phosphite	1.0–3.0 qt Fosphite, Rampart/100 gal water 1.25 qt Alude/40 gal water 1.0–2.0 qt Fungi-Phite/30 gal water 2.0–4.0 pt ProPhyt	0	Do not apply to plants that are stressed due to heat or moisture. Do not apply when leaf wetness periods of more than 4 hours are expected. Do not apply at less than 3-day intervals.
	potassium phosphite + tebuconazole	4.0 pt Viathon	7	Do not apply more than 12.0 pt/a per year. Apply prior to disease onset. For watermelon only.
	propamocarb hydrochloride	1.2 pt Previcur Flex OR 0.6–1.2 pt Previcur Flex <i>plus</i> tank-mix partner	2	Use as a foliar spray in a preventive program. Begin applications when conditions are favorable for disease, but before infection. Continue at 7- to 14-day intervals until the threat of disease is over. When applying at intervals longer than 7 days, alternate with an application of a contact fungicide midway between applications. Do not apply more than 6.0 pt/a Previcur Flex per season.
	pyraclostrobrin	8.0–12.0 oz Cabrio EG		Do not exceed 4 applications of strobilurin fungicides per crop per year.
	trifloxystrobin	4.0 oz Flint	0	Begin application prior to disease onset. Follow resistance management guidelines as per the label.
	zoxamide + chlorothalonil	36.0 fl oz Zing	0	Do not make more than 2 sequential applications before alternating to a fungicide of a different mode of action.
	zoxamide + mancozeb	1.5–2.0 lb Gavel 75DF	5	Do not exceed 8 applications or apply more than 16 lb/a product (10.67 lb ai mancozeb or 1.33 lb zoxamide) per season.

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Disease control in melon—muskmelon, watermelon *(continued)*

Disease	Active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Fusarium wilt	<i>The only practical control is to grow wilt-resistant varieties. A lone crop rotation with crops other than melons can be beneficial.</i>			
Mosaic	<i>Plant resistant varieties. When possible, control by isolation from the following plants: burdock, catnip, china aster, chrysanthemum, wild cucumber, geranium, gladiolus, wild ground cherry, horse nettle, hyacinth, jimsonweed, larkspur, lily, marigold, milkweed, morning glory, nasturtium, petunia, phlox, pokeweed, salvia, snapdragon, flowering spurge, tulip, white cockle, and zinnia. Control aphids that spread the disease (see Insect Control table).</i>			
Phytophthora blight or crown rot <i>(Phytophthora capsici)</i>	ametoctradin + dimethomorph	14.0 fl oz Zampro	0	Begin application prior to disease development and continue on a 5- to 7-day interval. Make no more than 3 applications/a per season.
	cyazofamid	2.75 fl oz Ranman 400SC	0	Do not apply more than six sprays or 16.5 fl oz/a of Ranman per year. Alternate Ranman (Group 21) sprays with a fungicide having a different mode of action. Crops not listed on the label should not be planted within 30 days after the last application.
	dimethomorph	6.0 fl oz Forum	0	Do not exceed 30.0 fl oz/a per growing season. Do not make more than 5 applications per season. Do not make more than 2 sequential applications of Forum before alternating to another effective fungicide with a different mode of action for at least one application.
	famoxadone + cymoxanil	8.0–10.0 oz Tanos	3	Do not make more than 1 application of Tanos before alternating with a fungicide having a different mode of action. Do not make more than 4 applications of Tanos or other Group 11 fungicides per season. Do not exceed 32.0 oz/a Tanos per crop per season. Tanos is helpful for suppressing Phytophthora blight. Tanos must be tank mixed with a contact fungicide such as mancozeb, chlorothalonil, or copper-containing fungicide.
	fluopicolide	3.0–4.0 fl oz Presidio	2	Tank mix this product with another labeled non-Group 43 fungicide. May be applied through irrigation.
	fosetyl-al	2.0–5.0 lb Aliette WDG, Linebacker WDG	12 hr	Begin applications when conditions favor disease development (high moisture and moderate temperatures). Repeat at 7- to 14-day intervals. Do not exceed 7 applications per season.
	hydrogen dioxide	1:100–1:2000 dilution rate OxiDate	0	Root and cutting dip treatment, soil drench, and seed treatments are registered. See label for application details. Follow tank-mixing instructions on label; some incompatibility issues exist. See cucurbit section of label for further details among crop grouping. Allowable for use in organic systems.
	mandipropamid	8.0 fl oz Revus	0	Do not exceed 1 application before switching to another effective non-Group 40 fungicide. An adjuvant must be applied with Revus.
oxathiapiprolin	2.0–4.8 fl oz Orondis Opti A, Orondis Ultra A 2.4–19.2 fl oz Orondis Gold 200	0	Make no more than 2 sequential applications before rotating to a fungicide with a different mode of action. Do not exceed 19.2 fl oz/a per year. Begin foliar applications prior to disease development. Do not use Orondis Ultra A as a foliar application if you have already used Orondis Gold 200 on the soil at time of planting. Soil applications of Orondis Gold 200 are to be applied at-plant, in-furrow, or by drip irrigation treatment only.	

(continued)

Eggplant

Hops

Horse radish

Leafy greens

Melon

Mint

Onion

Disease control in melon—muskmelon, watermelon *(continued)*

Disease	Active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Phytophthora blight or crown rot <i>(cont.)</i>	phosphorous acid, mono- and dibasic sodium, potassium, and ammonium salts	2.5–5.0 pt Phostrol 1.0–3.0 qt Confine Extra in 20 gal water	0	Do not exceed 7 applications per season.
	potassium phosphite	1.0–3.0 qt Fosphite, Rampart/100 gal water 1.0–2.0 qt Fungi-Phite/30 gal water 1.25 qt Alude/40 gal water 2.0–4.0 pt ProPhyt	0	Do not apply to plants that are stressed due to heat or moisture. Do not apply when leaf wetness periods of more than 4 hours are expected. Do not apply at less than 3-day intervals.
	zoxamide + mancozeb	1.5–2.0 lb Gavel 75DF	5	Do not exceed 8 applications or apply more than 16.0 lb/a Gavel (10.67 lb ai/a mancozeb or 1.33 lb ai/a zoxamide) per season.
Powdery mildew	azoxystrobin	10.0–15.5 fl oz Quadris Flowable, Satori 11.0–15.5 fl oz Aframe	1 1	Quadris, Satori, Cabrio, and Flint belong to the Group 11 (strobilurin) fungicide category. Quadris Opti contains a combination of Group 11 and Group M fungicides. Do not exceed 1 application of any of these products before alternating with a fungicide having a different mode of action. Do not exceed 4 applications of strobilurin fungicides per crop per year. Do not exceed 1.92 qt/a Quadris or Satori, 64.0 oz/a Cabrio, 8.0 oz/a Flint, or 2.0 gal/a Quadris Opti per season. Do not tank mix Quadris, Satori, Cabrio, Flint, or Quadris Opti with additives or adjuvants.
	azoxystrobin + chlorothalonil	3.2 pt Quadris Opti	1	
	pyraclostrobin	12.0–16.0 oz Cabrio EG	0	
	trifloxystrobin	1.5–2.0 oz Flint	0	
	boscalid + pyraclostrobin	12.5–18.5 oz Pristine WDG	0	
	chlorothalonil	1.8–2.7 lb Bravo Ultrex	0	Apply when conditions favor disease. See further instruction in the anthracnose section.
	clarified hydrophobic extract of neem oil	0.5–1.0% Trilogy in 25–100 gal water or 2.0 pt in at least 5 gal water/a	0	Do not apply more than 2 gal/a of Trilogy. OMRI-approved.
	cyflufenamid	3.4 oz Torino	0	Do not make more than 2 applications/a per year. Do not exceed a total of 6.8 oz/a per year.
	cyprodinil + difenoconazole	16.0–20.0 fl oz Inspire Super	7	Do not apply more than 80.0 fl oz/a per year. Make no more than 2 sequential applications before alternating to an effective fungicide with a different mode of action.
	cyprodinil + fludioxonil	11.0–14.0 oz Switch 62.5WG	1	Do not apply more than 56.0 fl oz/a per year. Make no more than 2 sequential applications before alternating to an effective fungicide with a different mode of action.
	fluopyram + tebuconazole	6.0–17.0 fl oz Luna Experience	7	Do not apply with aerial application equipment. Follow resistance management guidelines.
	fluopyram + trifloxystrobin	4.0–7.6 fl oz Luna Sensation	0	For watermelon only. A mild yellowing on leaf margins may be noted with Luna Sensation. Follow resistance management guidelines.

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Disease control in melon—muskmelon, watermelon *(continued)*

Disease	Active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Powdery mildew <i>(cont.)</i>	flutriafol	10.0–14.0 fl oz Topguard	0	Do not make more than 4 applications per acre per year. Follow resistance management guidelines. Not for muskmelon.
	fluxapyroxad + pyraclostrobin	4.0–5.5 fl oz Merivon	0	Do not apply more than 3 applications per acre per season.
	hydrogen dioxide	1:100–1:2000 dilution rate OxiDate	0	Root and cutting dip treatment, soil drench, and seed treatments are registered. See label for application details. Follow tank-mixing instructions on label; some incompatibility issues exist. See cucurbit section of label for further details among crop grouping. Allowable for use in organic systems.
	kresoxim methyl	3.2–4.8 oz Sovran	0	Not labeled for use in the greenhouse. This is a Group 11 strobilurin fungicide. Do not make more than 4 applications of Sovran or other strobilurin fungicides per acre per year.
	metrafenone	15.4 fl oz Vivando	0	Follow resistance management guidelines.
	myclobutanil	2.5–5.0 oz Rally 40WSP	0	Do not exceed 1.5 lb/a product (0.6 lb ai/a) per year. Observe a 30-day plantback interval between last application and planting new crops.
	neem oil	1% solution Trilogy	0	Thorough coverage is essential for good disease control. Also provides control of some insect crop pests.
	potassium bicarbonate	2.4–5.0 lb Kaligreen	0	Use higher rate when environmental conditions favor disease and pressure is high. Begin application at first sign of disease.
	potassium phosphite	1.0–3.0 qt Fosphite, Rampart/100 gal water 1.0–2.0 qt Fungi-Phite/20 gal water 1.25 qt Alude/40 gal water 2.0–4.0 pt ProPhyt	0	Do not apply to plants that are stressed due to heat or moisture. Do not apply when leaf wetness periods of more than 4 hours are expected. Do not apply at less than 3-day intervals.
	potassium phosphite + tebuconazole	2.0–3.0 pt Viathon	7	Apply prior to disease onset. Apply no more than 12.0 pt/a per year. For use on watermelon only.
	quinoxifen	4.0–6.0 fl oz Quintec	3	Do not apply more than 24.0 fl oz/a per year. Do not apply more than 2 consecutive applications before alternating to an effective fungicide with a different mode of action.
	sulfur	2.0–4.0 lb Micro Sulf 5.0–10.0 lb Microthiol Disperss	0	Do not apply with oils or when temperatures are 90°F or higher. Phytotoxicity can occur.
	tebuconazole	4.0–6.0 fl oz Folicur 3.6 F, Monsoon, Onset 3.6L, Orius 3.6F, Tebusha 3.6FL, TebuStar 3.6L, Tebuzol 3.6F, Toledo	7	Do not exceed 24.0 fl oz/a per season.
	thiophanate methyl	0.5 lb Topsin M 70W, Topsin M WSB 10.0 fl oz Topsin 4.5FL 0.2–0.4 lb Thiophanate methyl 85WDG	0	Apply when disease first appears and repeat if needed every 7–14 days.
trifloxystrobin	1.5–2.0 oz Flint	0	Begin application prior to disease onset. Follow resistance management guidelines on label.	

(continued)

Eggplant

Hops

Horseradish

Leafy greens

Melon

Mint

Onion

Disease control in melon—muskmelon, watermelon *(continued)*

Disease	Active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Powdery mildew <i>(cont.)</i>	triflumizole	4.0–8.0 oz Procure 50WS, Procure 480SC	0	Do not apply more than 40.0 oz/a Procure per season. See product label for plantback restrictions for leafy vegetables (30 days), root vegetables (60 days) and all other crops (1 yr). For greenhouse melon production, 4.0–8.0 fl oz in 100 gal water.
Seed rot and damping-off	azoxystrobin	0.1–0.38 fl oz Dynasty/100 lb seed	—	Follow manufacturer's directions. Not intended for food or feed source.
	captan	0.5–1.0 teaspoon Captan 50% WP/lb of dry seed	—	Use disease-free soil. Water plants in morning. Chemicals listed are seed treatments. Do not use treated seed for feed or food.
	fludioxonil	0.08–0.16 fl oz Dyna-Shield, Maxim 4FS, Spirato 480 FS	—	Follow manufacturer's directions. Not intended for food or feed source.
	mefenoxam	1.0–2.0 pt Ridomil Gold SL 2.0–4.0 pt Ultra Flourish	— —	Preplant-incorporated application or surface application at planting. Preplant to top 2 inches of soil.
		0.085–0.64 fl oz Apron XL/100 lb seed	—	Follow manufacturer's directions. Do not use treated seed for feed or food.
	mefenoxam + azoxystrobin	0.34 fl oz Uniform/1,000 ft row	—	Apply Uniform as an in-furrow spray in a minimum of 5 gal of water per acre at planting.
	metalaxyl	4.0–8.0 pt MetaStar 2E AG	—	Preplant-incorporated application or surface application at planting. Preplant to top 2 inches of soil.
		0.7 fl oz/100 lb seed Sebring 2.65 ST 0.75 fl oz/100 lb seed Allegiance FL, Metalaxyl 265 ST	— —	Follow manufacturer's directions. Do not use treated seed for feed or food.
	thiram	0.75 teaspoon Thiram 50% WP/lb seed	—	Use disease-free soil. Water plants in morning. Chemicals listed are seed treatments. Do not use treated seed for feed or food.

Scouting calendar for insect pests of melon

	April			May			June			July			August			September		
	early	mid	late	early	mid	late	early	mid	late	early	mid	late	early	mid	late	early	mid	late
Wireworms																		
Aphids																		
Striped and spotted cucumber beetles																		
Seed maggot																		
Mites																		

Insect control in melon—muskmelon, watermelon

Insect	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Bean aphid and soybean aphid	alpha-cypermethrin	3.4–3.8 fl oz *Fastac	1	Apply when pests reach or exceed established thresholds. Do not apply more than 11.4 fl oz of Fastac per acre per crop season.
	flupyradifurone	foliar: 7.0–12.0 fl oz Sivanto	1	Apply when pests reach or exceed established thresholds. Do not apply more than 28.0 fl oz of Sivanto per acre per crop season.
		soil: 21.0–28.0 fl oz Sivanto	21	
	lambda-cyhalothrin + chlorantraniliprole	9.0 fl oz *Voliam Xpress	1	Allow at least 5 days between applications. Do not apply more than 31.0 fl oz/a Voliam Xpress per season.
spirotetramat	4.0–5.0 fl oz Movento	1 (edible) 7 (dry)	Do not apply more than 10.0 fl oz/a per season and allow at least 7 days between applications.	
Caterpillar pests (cutworms, cabbage looper, diamond-back moth)	0.0065–0.0125 lb beta-cyfluthrin	0.8–1.6 fl oz *Baythroid XL	0	Apply every 7 days as needed. Do not exceed 11.2 fl oz/a.
	bifenthrin	2.1–6.4 fl oz *Brigade 2EC	7	Do not exceed 0.5 lb ai/a or 5 applications per season. Wait at least 7 days between treatments.
		3.4–6.8 fl oz *Capture LFR	16	Do not exceed 0.1 lb ai/a as an at-plant application; do not exceed 0.5 lb ai/a per season of all bifenthrin products.
	bifenthrin + zeta-cypermethrin	4.0–10.3 fl oz *Hero	3	Do not apply more than 10.3 fl oz/a per season and allow at least 7 days between applications. Do not apply more than 41.2 fl oz of product/a per crop season.
	1.0 lb carbaryl	Sevin Bait (several formulations)	1	Broadcast when cutworms are present in damaging numbers.
	chlorantraniliprole	3.5–7.5 fl oz Coragen	1	Do not make more than 4 applications per crop season and allow at least 3 days between applications. Do not apply more than 15.4 fl oz/a Coragen per season.
	0.088–0.176 lb cyantraniliprole (soil)	6.75–13.5 fl oz Verimark	1	Do not apply more than 13.5 fl oz/a Verimark per crop per season. Do not apply more than 0.4 lb ai/a cyantraniliprole-containing products per crop whether applied as soil or foliar applications. The pH of the application solution should be adjusted to between pH 4 and 6.
		10.0–17.0 fl oz Exirel	1	
	0.065–0.11 lb cyantraniliprole (foliar)			Minimum application interval between foliar sprays is 5 days.
	0.012–0.028 lb deltamethrin	1.0–2.4 fl oz *Delta Gold	3	Apply every 3 days as needed. Do not exceed 14.4 fl oz/a per season.
	0.03–0.05 lb esfenvalerate	5.8–9.6 fl oz *Asana XL	3	Use as a rescue treatment when worms are present.
	0.03–0.045 lb flubendiamide	2.0–3.0 oz Synapse WG	1	Do not apply more than 3.0 oz/a (0.045 lb ai/a) in a 7-day period or more than 9.0 oz/a per season.
	flubendiamide + buprofezin	12.0–17.0 fl oz Vetica	7	Do not apply more than 38.0 fl oz/a per season and allow at least 7 days between applications. Do not make more than 3 applications per crop season.
0.02–0.03 lb lambda-cyhalothrin II	1.28–1.92 fl oz *Warrior II	4	Do not exceed 0.18 lb ai/a per season. Reapply at intervals of 5 or more days.	
lambda-cyhalothrin + chlorantraniliprole	6.0–9.0 fl oz *Voliam Xpress	1	Do not exceed 31.0 fl oz/a of Voliam Xpress or 0.18 lb ai/a of products containing lambda-cyhalothrin or 0.2 lb ai/a of products containing chlorantraniliprole per growing season.	
lambda-cyhalothrin + thiamethoxam	4.0–4.5 fl oz *Endigo ZC	1	Apply when pests reach or exceed established thresholds. Do not apply more than 19.0 fl oz/a Endigo ZC per crop season and allow at least 5 days between applications.	

*Restricted-use pesticide.

(continued)

Eggplant

Hops

Horseradish

Leafy greens

Melon

Mint

Onion

Insect control in melon—muskmelon, watermelon *(continued)*

Insect	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Caterpillar pests (<i>cont.</i>)	0.1–0.2 lb permethrin	*Ambush	0	See label for rate. Do not exceed 1.6 lb ai/a per year.
	spiromesifen	7.0–8.5 fl oz Oberon 2 SC	7	Apply every 7 days as needed. Do not exceed 25.5 fl oz/a per season.
	0.01–0.025 lb zeta-cypermethrin	1.28–4.0 oz *Mustang Maxx	1	Apply at thresholds and do not exceed 24.0 oz/a Mustang Maxx per season.
Cucumber beetles (striped, spotted)	<i>Treat when there are more than four to five adults per 50 plants.</i>			
	0.047–0.10 lb acetamiprid	2.5–5.3 oz Assail 30 SG	0	Do not exceed 5 applications or 26.5 oz/a of product per crop season.
	0.05–0.10 lb acetamiprid	1.1–2.3 oz Assail 70WP	0	Do not exceed 5 applications or 11.5 oz/a of product per crop season.
	alpha-cypermethrin	3.0–3.8 fl oz *Fastac	1	Apply when pests reach or exceed established thresholds. Do not apply more than 11.4 fl oz of Fastac per acre per crop season.
	0.019–0.022 lb beta-cyfluthrin	2.4–2.8 fl oz *Baythroid XL	0	Apply every 7 days as needed. Do not exceed 11.2 fl oz/a.
	0.033–0.10 lb bifenthrin	2.1–6.4 fl oz *Brigade 2EC	7	Do not exceed 0.5 lb ai/a or 5 applications per season. Wait at least 7 days between treatments.
		6.8–8.5 fl oz *Capture LFR	16	Do not exceed 0.1 lb ai/a as an at-plant application; do not exceed 0.5 lb ai/a per season of all bifenthrin products.
	bifenthrin + zeta-cypermethrin	4.0–10.3 fl oz *Hero	3	Do not apply more than 10.3 fl oz/a per season and allow at least 7 days between applications. Do not apply more than 41.2 fl oz of product/a per crop season.
	0.5–1.0 lb carbaryl	Sevin (several formulations)	0	Do not apply during maximum flowering or fruit set, or when pollinating bees are in the field. Spray during the evening.
	clothianidin	<i>foliar</i> : 3.0–4.0 fl oz Belay	21	Do not apply more than 12.0 fl oz/a per season and allow at least 7 days between applications.
		<i>soil</i> : 9.0–12.0 fl oz Belay	—	Do not apply more than 12.0 fl oz/a per season. Apply as a narrow band centered on the plant row; as an in-furrow spray at planting; as a sidedress to both sides of the row; as a transplant water drench; or as chemigation into root zone through drip, trickle or micro-sprinkler, or similar equipment.
	0.018–0.024 lb deltamethrin	1.5–2.4 fl oz *Delta Gold	3	Apply every 3 days as needed. Do not exceed 14.4 fl oz/a per season.
0.05–0.18 lb dinotefuran (<i>foliar</i>)	2.0–7.0 oz Scorpion 35SL	1	Can repeat at 7-day intervals. Do not apply more than 10.5 oz per year.	
0.132–0.179 lb dinotefuran	3.0–4.0 oz Venom 70SG	1	Do not apply more than 62.0 oz/a per season.	
0.03–0.05 lb esfenvalerate	5.8–9.6 fl oz *Asana XL	3	Do not exceed 0.25 lb ai/a per year.	
0.2–0.3 lb fenpropathrin	10.66–16.0 oz *Danitol 2.4EC	7	Do not exceed 2.66 pt/a per season.	
imidacloprid	7.0–10.5 fl oz Admire Pro	21	Apply in a narrow band centered on plant row within 14 days before planting or as an in-furrow treatment during planting. Do not exceed 0.38 lb ai/a per year.	
0.02–0.03 lb lambda-cyhalothrin	1.28–1.92 fl oz *Warrior II	4	Do not exceed 0.18 lb ai/a per season. Reapply at intervals of 5 or more days.	

*Restricted-use pesticide.

(continued)

Insect control in melon—muskmelon, watermelon *(continued)*

Insect	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Cucumber beetles <i>(cont.)</i>	lambda-cyhalothrin + chlorantraniliprole	6.0–9.0 fl oz *Voliam Xpress	1	Do not exceed a total of 31.0 fl oz/a of Voliam Xpress or 0.18 lb ai/a of products containing lambda-cyhalothrin or 0.2 lb ai/a of products containing chlorantraniliprole per season.
	lambda-cyhalothrin + thiamethoxam	4.0–4.5 fl oz *Endigo ZC	1	Apply when pests reach or exceed established thresholds. Do not apply more than 19.0 fl oz/a Endigo ZC per crop season and allow at least 5 days between applications.
	0.94–1.9 lb malathion	several formulations	1	Do not apply before vining or to wet plants.
	0.45–0.9 lb methomyl	1.5–3.0 pt *Lannate LV 0.5–1.0 lb *Lannate SP	1–3	See label for days to harvest.
	0.5–1.0 lb oxamyl	2.0–4.0 pt *Vydate L	1	Make first application 2–4 weeks after planting. Repeat 2–3 weeks later.
	0.1–0.2 lb permethrin	*Ambush, *Pounce	0	Several formulations; see label for rate. Do not exceed 1.6 lb ai/a per year.
	thiamethoxam	3.0–5.5 oz Actara 25WDG	0	Do not follow applications of Platinum 2SC with foliar applications of any other neonicotinoid insecticide. Platinum may be applied to direct seeded crops in-furrow at seeding or transplant depth, or as a narrow surface band above the seedling and followed by irrigation. Do not apply more than 11.0 oz of Actara 25WDG or Platinum 2SC and no more than 3.67 oz Platinum 75SG per acre per crop season and apply sufficient water volume after in-ground application to ensure incorporation into the seed zone. Actara is applied as a foliar spray.
		5.0–11.0 fl oz Platinum 2SC	30	
		1.66–3.67 oz Platinum 75SG	30	
	0.198–0.257 lb thiamethoxam + chlorantraniliprole	10.0–13.0 fl oz Durivo	30	Do not exceed a total of 13.0 fl oz/a Durivo (0.257 lb ai/a) per growing season. Do not exceed 0.172 lb ai/a of thiamethoxam-containing products or 0.2 lb ai/a of chlorantraniliprole-containing products per season.
0.02–0.025 lb zeta-cypermethrin	2.8–4.0 oz *Mustang Maxx	1	Apply at thresholds and do not exceed 24.0 oz/a Mustang Maxx per season.	
Melon aphid	0.047–0.075 lb acetamiprid	2.5–4.0 oz Assail 30 SG	0	Do not exceed 5 applications or 26.5 oz/a of product per crop season.
	0.05–0.10 lb acetamiprid	1.1–1.7 oz Assail 70WP	0	Do not exceed 5 applications or 11.5 oz/a of product per crop season.
	alpha-cypermethrin	3.4–3.8 fl oz *Fastac	1	Apply when pests reach or exceed established thresholds. Do not apply more than 11.4 fl oz of Fastac per acre per crop season.
	0.04–0.10 lb bifenthrin	2.6–6.4 fl oz *Brigade 2EC	3	Apply every 7 days as needed. Do not exceed 0.3 lb ai/a per season. Do not make more than 2 applications after bloom.
	bifenthrin + zeta-cypermethrin	4.0–10.3 fl oz *Hero	3	Do not apply more than 10.3 fl oz/a per season and allow at least 7 days between applications. Do not apply more than 41.2 fl oz of product/a per crop season.
	clothianidin	<i>foliar</i> : 3.0–4.0 fl oz Belay	21	Do not apply more than 12.0 fl oz/a per season and allow at least 7 days between applications.
		<i>soil</i> : 9.0–12.0 fl oz Belay	—	Do not apply more than 12.0 fl oz/a per season. Apply as a narrow band centered on the plant row; as an in-furrow spray at planting; as a sidedress to both sides of the row; as a transplant water drench; or as chemigation into root zone through drip, trickle or micro-sprinkler, or similar equipment.

*Restricted-use pesticide.

(continued)

Eggplant

Hops

Horse radish

Leafy greens

Melon

Mint

Onion

Insect control in melon—muskmelon, watermelon *(continued)*

Insect	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Melon aphid (<i>cont.</i>)	0.088–0.176 lb cyantraniliprole (<i>soil</i>)	6.75–13.5 fl oz Verimark	1	Do not apply more than 13.5 fl oz/a Verimark per crop per season. Do not apply more than 0.4 lb ai/a cyantraniliprole-containing products per crop whether applied as soil or foliar applications. The pH of the application solution should be adjusted to between pH 4 and 6. Minimum application interval between foliar sprays is 5 days.
	0.088–0.133 lb cyantraniliprole (<i>foliar</i>)	13.5–20.5 fl oz Exirel	1	
Hops	0.25–0.75 lb diazinon	several formulations	3	Apply as soon as aphids are noticed.
	0.5 lb dimethoate	1.0 pt Dimethoate EC	3	
Horseradish	0.045–0.268 lb dinotefuran	<i>foliar</i> : 1.0–4.0 oz Venom 70SG	1	Do not follow soil applications with foliar application of any other neonicotinoid insecticide. Use only one application method. Do not apply more than 12.0 oz/a per season using soil applications. See product label for application directions.
		<i>soil</i> : 5.0–6.0 oz Venom 70SG	21	
	0.05–0.18 lb dinotefuran (<i>foliar</i>)	2.0–7.0 oz Scorpion 35SL	1	
	0.23–0.27 lb dinotefuran (<i>soil</i>)	9.0–10.5 oz Scorpion 35SL	21	
Leafy greens	0.062–0.089 lb flonicamid	2.0–2.8 oz Beleaf SG	0	Begin applications before aphid populations build. Do not exceed 2.8 oz/a Beleaf per application and do not apply more than 8.4 oz/a (0.267 lb ai/a) per season.
	flupyradifurone	<i>foliar</i> : 10.5–14.0 fl oz Sivanto	1	Apply when pests reach or exceed established thresholds. Do not apply more than 28.0 fl oz of Sivanto per acre per crop season.
		<i>soil</i> : 21.0–28.0 fl oz Sivanto	21	
	imidacloprid	7.0–10.5 fl oz Admire Pro	21	Apply in a narrow band centered on plant row within 14 days before planting or as an in-furrow treatment during planting. Do not exceed 0.38 lb ai/a per year.
	0.02–0.03 lb lambda-cyhalothrin	1.28–1.92 fl oz *Warrior II	4	Do not exceed 0.18 lb ai/a per season. Reapply at intervals of 5 or more days.
lambda-cyhalothrin + chlorantraniliprole	9.0 fl oz *Voliam Xpress	1	Do not exceed 31.0 fl oz/a of Voliam Xpress or 0.18 lb ai/a of products containing lambda-cyhalothrin or 0.2 lb ai/a of products containing chlorantraniliprole per growing season.	
Melon	lambda-cyhalothrin + thiamethoxam	4.0–4.5 fl oz *Endigo ZC	1	Apply when pests reach or exceed established thresholds. Do not apply more than 19.0 fl oz/a Endigo ZC per crop season and allow at least 5 days between applications.
	1.0–2.0 lb malathion	several formulations	1	Do not apply before vining or to wet plants.
	0.45–0.9 lb methomyl	1.5–3.0 pt *Lannate LV 0.5–1.0 lb *Lannate SP	1–3	Do not exceed 5.4 lb ai/a per season.
	pymetrozine	2.75 oz Fulfill 50WDG	14	Controls melon and green peach aphids. Treat when aphids first appear. May repeat in 7 days. Do not exceed 5.5 oz/a per season or more than 2 applications per crop.
	thiamethoxam	2.0–3.0 oz Actara 25WDG	0	Do not apply more than 11.0 oz of Actara 25WDG or Platinum 2SC and no more than 3.67 oz Platinum 75SG per acre per crop season and apply sufficient water volume after in-ground application to ensure incorporation into the seed zone. Actara is applied as a foliar spray.
5.0–11.0 fl oz Platinum 2SC		30		
1.66–3.67 oz Platinum 75SG		30		

*Restricted-use pesticide.

(*continued*)

Insect control in melon—muskmelon, watermelon *(continued)*

Insect	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Melon aphid <i>(cont.)</i>	0.198–0.257 lb thiamethoxam + chlorantraniliprole	10.0–13.0 fl oz Durivo	30	Do not exceed a total of 13.0 fl oz/a Durivo (0.257 lb ai/a) per growing season. Do not exceed 0.172 lb ai/a of thiamethoxam-containing products or 0.2 lb ai/a of chlorantraniliprole-containing products per season.
	0.02–0.025 lb zeta-cypermethrin	3.2–4.0 oz *Mustang Maxx	1	Apply at thresholds and do not exceed 24.0 oz/a Mustang Maxx per season.
Seed corn maggot	0.04–0.08 lb bifenthrin	3.4–6.8 oz *Capture LFR		Apply as a 5- to 7-inch band over an open furrow or in-furrow with the seed. Do not exceed 0.1 lb/a per season as an at-plant application.
	0.13–0.176 lb cyantraniliprole (soil)	10.0–13.5 fl oz Verimark	1	Do not apply more than 13.5 fl oz/a Verimark per crop per season. Do not apply more than 0.4 lb ai/a cyantraniliprole-containing products per crop whether applied as soil or foliar applications. The pH of the application solution should be adjusted to between pH 4 and 6.
	0.01–0.025 lb zeta-cypermethrin	1.28–4.0 oz *Mustang Maxx	1	Apply at thresholds and do not exceed 24.0 oz/a Mustang Maxx per season.
Spider mite	0.938–1.88 lb abamectin	8.0–16.0 fl oz *Agri-Mek 0.15EC	7	May repeat after 7 days, but do not make more than two sequential treatments or exceed 5.64 lb ai/a per year.
	bifenazate	0.75–1.0 lb Acramite 50WS	3	Do not exceed 1 application per season.
	0.08–0.10 lb bifenthrin	5.12–6.4 fl oz *Brigade 2EC	3	Apply before insects reach threshold levels. May repeat applications after 7 days, but do not make more than 2 applications after bloom. Do not exceed 0.3 lb ai/a per season.
	bifenthrin + zeta-cypermethrin	10.3 fl oz *Hero	3	Do not apply more than 10.3 fl oz/a per season and allow at least 7 days between applications. Do not apply more than 41.2 fl oz of product/a per crop season.
	0.25–0.5 lb dimethoate	0.5–1.0 pt Dimethoate EC	3	
	0.09–0.14 lb etoxazole	2.0–3.0 oz Zeal	7	Do not make more than 1 application of Zeal or exceed 0.14 lb ai/a per season.
	0.2 lb fenpropathrin	10.66 fl oz *Danitol 2.4EC	7	Treat when mites first appear and repeat every 7 days as needed. Do not exceed 0.8 lb ai/a per season.
	lambda-cyhalothrin + thiamethoxam	4.5 fl oz *Endigo ZC	1	Apply when pests reach or exceed established thresholds. Do not apply more than 19.0 fl oz/a Endigo ZC per crop season and allow at least 5 days between applications.
	spiromesifen	7.0–8.5 fl oz Oberon 2 SC	7	Apply every 7 days as needed. Do not exceed 25.5 fl oz/a per season.
	Squash bug	<i>Check undersides of leaves for squash bug eggs laid in neat rows. Eggs hatch within 1–2 weeks. Treat when squash bugs are young; they are difficult to control as older nymphs or adults. Destroy crop residue in fall to reduce overwinter survival of this pest.</i>		
0.10 lb acetamiprid		2.3 oz Assail 70WP	0	Do not exceed 5 applications or 11.5 oz/a of product per crop season.
		5.3 oz Assail 30 SG	0	Do not exceed 5 applications or 26.5 oz/a of product per crop season.
alpha-cypermethrin		3.0–3.8 fl oz *Fastac	1	Apply when pests reach or exceed established thresholds. Do not apply more than 11.4 fl oz of Fastac per acre per crop season.
0.04–0.10 lb bifenthrin	2.6–6.4 fl oz *Brigade 2EC	3	Apply every 7 days as needed. Do not exceed 0.3 lb ai/a per season. Do not make more than 2 applications after bloom.	

*Restricted-use pesticide.

(continued)

Eggplant

Hops

Horse radish

Leafy greens

Melon

Mint

Onion

Insect control in melon—muskmelon, watermelon *(continued)*

Insect	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Squash bug <i>(cont.)</i>	bifenthrin + zeta-cypermethrin	4.0–10.3 fl oz *Hero	3	Do not apply more than 10.3 fl oz/a per season and allow at least 7 days between applications. Do not apply more than 41.2 fl oz of product/a per crop season.
	0.5–1.0 lb carbaryl	Sevin (several formulations)	0	Do not apply during maximum flowering or fruit set, or when pollinating bees are in the field. Spray during the evening.
Hops	clothianidin	<i>foliar</i> : 3.0–4.0 fl oz Belay	21	Do not apply more than 12.0 fl oz/a per season and allow at least 7 days between applications.
		<i>soil</i> : 9.0–12.0 fl oz Belay	—	Do not apply more than 12.0 fl oz/a per season. Apply as a narrow band centered on the plant row; as an in-furrow spray at planting; as a sidedress to both sides of the row; as a transplant water drench; or as chemigation into root zone through drip, trickle or micro-sprinkler, or similar equipment.
Horseradish	0.03–0.05 lb esfenvalerate	5.8–9.6 fl oz *Asana XL	3	Do not exceed 0.25 lb ai/a per year.
	0.05–0.18 lb dinotefuran	2.0–7.0 oz Scorpion 35SL	1	Can repeat at 7-day intervals. Do not apply more than 10.5 oz per year.
	0.132–0.179 lb dinotefuran	3.0–4.0 oz Venom 70SG	1	Do not apply more than 6.0 oz/a per season.
	flupyradifurone	<i>foliar</i> : 10.5–14.0 fl oz Sivanto <i>soil</i> : 21.0–28.0 fl oz Sivanto	1	Apply when pests reach or exceed established thresholds. Do not apply more than 28.0 fl oz of Sivanto per acre per crop season.
21				
Leafy greens	0.02–0.03 lb lambda-cyhalothrin	1.28–1.92 fl oz *Warrior II	4	Do not exceed 0.18 lb ai/a per season. Reapply at intervals of 5 or more days.
	lambda-cyhalothrin + chlorantraniliprole	6.0–9.0 fl oz *Voliam Xpress	1	Do not exceed 31.0 fl oz/a of Voliam Xpress or 0.18 lb ai/a of products containing lambda-cyhalothrin or 0.2 lb ai/a of products containing chlorantraniliprole per growing season.
	lambda-cyhalothrin + thiamethoxam	4.0–4.5 fl oz *Endigo ZC	1	Apply when pests reach or exceed established thresholds. Do not apply more than 19.0 fl oz/a Endigo ZC per crop season and allow at least 5 days between applications.
Melon	0.1–0.2 lb permethrin	*Ambush, *Pounce	0	Will kill adult squash bugs. Several formulations; see label for rate.
	0.02–0.025 lb zeta-cypermethrin	2.8–4.0 oz *Mustang Maxx	1	Apply at thresholds and do not exceed 24.0 oz/a Mustang Maxx per season.
	Squash vine borer	<i>Treat when adults are observed (900 DD₅₀ or when chicory is in bloom), especially when runners are less than 2 feet long. Larvae boring in the main stem can kill the entire plant, while loss of a runner or two when the plant is larger will not cause economic damage. Look for sawdust-like excrement coming from holes in the stems, and open the stems to confirm the presence of squash vine borer larvae. Repeat applications at 5- to 7-day intervals throughout the 3-week egg-laying period.</i>		
0.10 lb acetamiprid		2.3 oz Assail 70WP	0	Do not exceed 5 applications or 11.5 oz/a of product per crop season.
		5.3 oz Assail 30 SG	0	Do not exceed 5 applications or 26.5 oz/a of product per crop season.
alpha-cypermethrin	3.0–3.8 fl oz *Fastac	1	Apply when pests reach or exceed established thresholds. Do not apply more than 11.4 fl oz of Fastac per acre per crop season.	
Onion	0.04–0.10 lb bifenthrin	2.6–6.4 fl oz *Brigade 2EC	3	Apply every 7 days as needed. Do not exceed 0.3 lb ai/a per season. Do not make more than 2 applications after bloom.

*Restricted-use pesticide.

(continued)

Insect control in melon—muskmelon, watermelon *(continued)*

Insect	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Squash vine borer <i>(cont.)</i>	bifenthrin + zeta-cypermethrin	4.0–10.3 fl oz *Hero	3	Do not apply more than 10.3 fl oz/a per season and allow at least 7 days between applications. Do not apply more than 41.2 fl oz of product/a per crop season.
	0.03–0.05 lb esfenvalerate	5.8–9.6 fl oz *Asana XL	3	Do not exceed 0.25 lb ai/a per season.
	flubendiamide + buprofezin	12.0–17.0 fl oz Vetica	7	Do not apply more than 38.0 fl oz/a per season and allow at least 7 days between applications. Do not make more than 3 applications per crop season.
	0.02–0.03 lb lambda-cyhalothrin	1.28–1.92 fl oz *Warrior II	4	Do not exceed 0.18 lb ai/a per season. Reapply at intervals of 5 or more days.
	lambda-cyhalothrin + chlorantraniliprole	6.0–9.0 fl oz *Voliam Xpress	1	Do not exceed 31.0 fl oz/a of Voliam Xpress or 0.18 lb ai/a of products containing lambda-cyhalothrin or 0.2 lb ai/a of products containing chlorantraniliprole per growing season.
	lambda-cyhalothrin + thiamethoxam	4.0–4.5 fl oz *Endigo ZC	1	Apply when pests reach or exceed established thresholds. Do not apply more than 19.0 fl oz/a Endigo ZC per crop season and allow at least 5 days between applications.
	0.1–0.2 lb permethrin	*Ambush, *Pounce	0	Several formulations; see label for rate. Do not apply more than 1.6 lb ai/a per season.
	0.02–0.025 lb zeta-cypermethrin	2.8–4.0 oz *Mustang Maxx	1	Apply at thresholds and do not exceed 24.0 oz/a Mustang Maxx per season.

*Restricted-use pesticide.

Eggplant

Hops

Horse radish

Leafy greens

Melon

Mint

Onion

Weed control in melon—muskmelon, watermelon

Weed	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Annual weeds	0.15–0.25 lb clomazone	0.4–0.67 pt Command 3ME		For suppression and control of annual grasses and broadleaves, make a single preemergent soil application before seeding or transplanting, or after seeding but prior to crop emergence. Place seed or roots of transplants below the chemical barrier when planting. Strictly follow all precautions and restrictions on the label to minimize offsite movement and carryover. Read and understand the vegetable disclaimer section of the label—the end user assumes all liability for failure to perform and crop injury resulting from its use.
	1.1–1.7 lb ethalfluralin	3.0–4.5 pt Curbit 3EC		Make a single broadcast application within 2 days after seeding. Rate varies with soil texture and organic matter. A shallow cultivation or 1/2-inch of water is needed to activate the herbicide. Heavy rain following application or shallow seeding may result in crop injury. Do not incorporate prior to planting, use under plastic mulch, broadcast over transplants, or apply through irrigation. Do not use on soils with more than 10% organic matter.
	0.4–1.2 lb ethalfluralin + 0.125–0.375 lb clomazone	2.0–6.0 pt Strategy	45	Use only as a postplant surface-applied herbicide. Make one application before crop and weeds emerge or apply as a banded spray between rows following crop emergence or transplanting. Do not make broadcast applications to transplants or use under plastic mulch. Strategy requires rainfall, irrigation, or a shallow cultivation within 2–5 days after application for activation. Because of the potential for offsite movement and severe crop injury, strictly follow all precautions and restrictions on the label.
	0.1–0.2 lb terbacil	2.0–4.0 oz Sinbar WDG	70	Watermelon only. Apply preemergence to seeded watermelon or prior to planting transplants. If using plastic mulch, Sinbar may be applied preemergence under plastic, to row middles, or broadcast over the plastic prior to hole punching or transplanting. See label for additional instructions.
	trifluralin	several manufacturers	60 (watermelon) 30 (all other cucurbits)	Direct spray between rows when plants have reached the three- to four-leaf stage. Set incorporation equipment to move treated soil around the base of plants. Controls annual grasses and some broadleaf weeds, but is weak on wild mustard, smartweed, common ragweed, velvetleaf, and black nightshade. Rate varies with soil texture and organic matter. Follow recommended soil preparation, application, and incorporation procedures. Must be incorporated within 24 hours. See label for plantback restrictions. Ineffective on peat and muck soils.
Annual grasses	5.0–6.0 lb bensulide	5.0–6.0 qt Prefar 4E		Apply preplant or preemergence. Follow application and applicable incorporation instructions on label. Use on mineral soils only.
Annual grasses and some broad-leaves	4.5–10.5 lb DCPA	6.0–14.0 lb Dacthal W-75 6.0–14.0 pt Dacthal FL		Apply to weed-free soil. Treat only if plants have four to five true leaves and are well established, and growing conditions are favorable or severe crop injury may result. Use only on soils with 5% or less organic matter.

*Restricted-use pesticide.

(continued)

Weed control in melon—muskmelon, watermelon *(continued)*

Weed	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Nutsedge and some broad-leaves	0.023–0.047 lb halosulfuron	0.5–1.0 oz Sandea (Rate varies by melon type, application type, and timing. See label for appropriate rate.)	57	Sandea controls several broadleaf weeds and nutsedge. It will not control grasses. Sandea has both pre- and postemergence activity and can be used under plastic mulch. Broadcast application to watermelon should not exceed 0.75 oz/a Sandea. Do not exceed 2 applications or apply more than 2.0 oz/a per 12-month period. Soil or foliar applications of organophosphate insecticides to Sandea-treated crops may cause severe crop injury. Consult label for application timing, maximum Sandea use per crop cycle, and other important usage information and precautions.
Emerged weeds	glyphosate	several manufacturers and formulations		See manufacturer’s label to assure that the formulation is labeled for this crop and for specific instructions. Some formulations require a wait of 3 days between application and seeding. Crop contact will result in severe injury or death. If weeds have been mowed or tilled, do not treat until they have resumed active growth and reached the recommended stage on the label. Unless otherwise stated, allow 7 or more days before tilling treated fields. Do not tank mix with soil-residual herbicides unless otherwise specified.
	*paraquat	several manufacturers and formulations, not all are registered for this use		Prepare seedbed early to allow for maximum weed emergence. Application can be made as a banded or broadcast treatment before, during, or after planting, but before crop emergence. In preplant and preemergence (to the crop) uses, do not apply to soils lacking clay minerals (i.e., muck, pure sand). Use the higher rate for heavy weed infestations. Seeding and transplanting should be performed with minimal soil disturbance. Always add crop oil concentrate or non-ionic surfactant to spray mixture. Follow precautions on label.
Emerged grasses	0.068–0.12 lb clethodim	9.0–16.0 oz Select Max	14	Apply to actively growing grasses. Repeat treatments may be made at 14-day intervals up to the maximum annual use rate. Do not cultivate grasses within 7 days before or after application. Include appropriate surfactant as required by product label. Do not apply if rain is expected within 1 hour.
	0.094–0.125 lb clethodim	6.0–8.0 oz Select 2EC	14	
	0.094–0.28 lb sethoxydim	0.5–1.5 pt Poast	3 (cantaloupe) 14 (all other melons)	Make postemergence applications to actively growing vgrasses within the size ranges indicated on the label. Check the label for wild proso millet or rescue treatment rates. Do not apply more than 3.0 pt/a Poast in one crop season. Always add 2.0 pt/a of crop oil concentrate. Check the label for additional precautions and restrictions.

*Restricted-use pesticide.

Eggplant

Hops

Horse radish

Leafy greens

Melon

Mint

Onion