

# Tomato

Pea

Pepper

Potato

Pumpkin & squash

Sweet corn

Table beet

Tomato

## Planting

Don't grow tomatoes in the same spot 2 years in succession. Rotate them with other crops—but not pepper, eggplant, or potato. Prepare bed 7–8 inches deep. The bed should be smoothed and free of weeds. Wisconsin's growing season is too short to allow direct planting of tomato seed. Instead, seed should be planted indoors around March 25 and transferred to a cold frame or hotbed May 1. Transplant after all danger of frost—about May 20–25 in southern Wisconsin and after June 1 in northern Wisconsin. Cultivate or hoe to control weeds. Do not cultivate after vines cover the ground. To avoid spreading plant diseases, do not hoe or cultivate when plants are wet. Alternatively, plastic mulch can be used to suppress weeds in the row. In addition, mulches increase tomato yield as compared to plants grown in bare soil.

Should plants be staked, caged, or left to sprawl? If cultivars are indeterminate (the terminal bud is vegetative), they should be caged or staked. If they are determinate (the terminal bud is a flower bud), you can cage them or let them sprawl. Each method has advantages and disadvantages.

Staked plants give a slightly earlier harvest, are cleaner, have somewhat larger fruit and are easier to harvest. However, extra labor is needed for weekly pruning and tying; fruit is more prone to cracking and sunscald; and more plants are needed to give the same yield.

Caged plants give higher quality, cleaner, and more abundant fruit compared to ordinary ground-type culture. They ripen later but are less susceptible to sunscald than staked plants. Caged plants do not need to be pruned.

Ground plants are the easiest to care for. However, they occupy the most space and fruit quality is compromised, especially for fruit touching the soil.

## Pruned and staked

**Rows:** 36–48 inches.

**Plants in row:** 12–24 inches apart.

## Caged

**Rows:** 36–48 inches.

**Plants in row:** 36 inches apart.

Use 10–12 ft<sup>2</sup> per plant for early varieties; use 15–20 ft<sup>2</sup> per plant for late or main crop varieties. Set 8-week-old plants 5–7 inches deep. Trench-in plants with long

stems. Water plants several hours before they are set to ensure that a "ball" of soil adheres to the roots at transplanting.

## Lime and fertilizer

**Lime:** Apply aglime to maintain a pH of 6.0 on mineral soils and 5.6 on organic soils.

**Fertilizer rates:** Apply P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O according to soil test recommendations. Use annual nitrogen, P<sub>2</sub>O<sub>5</sub>, and K<sub>2</sub>O recommendations in table below. Take credits for previous legume crops and manure. Adequate K<sub>2</sub>O fertilization is important for prevention of gray wall.

**Application:** Broadcast lime, P<sub>2</sub>O<sub>5</sub>, and K<sub>2</sub>O and work into soil before planting.

**Nitrogen:** On heavier soils, broadcast and incorporate with fertilizer before planting. On sandy soils, apply 20–40 lb N/a before setting plants and sidedress the balance of the nitrogen recommended in one or more applications after the first fruits set. Overapplication of nitrogen can lead to excess vegetative growth, delaying maturity and reducing yield.

**Micronutrients:** Tomato has relatively high requirements for most micronutrients. Use plant analysis to confirm if these nutrients may be in short supply.

## Annual nitrogen, phosphate, and potash recommendations for tomato

Nitrogen		Phosphate and potash		
Organic matter (%)	Amount to apply (lb/a)	Yield goal (t/a)	Amount P <sub>2</sub> O <sub>5</sub> to apply* (lb/a)	Amount K <sub>2</sub> O to apply* (lb/a)
<2	140	20–25	40	180
2.0–9.9	120			
10–20	100			
>20	50			

\*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.

## Disease control in tomato

Disease	Active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
<b>Bacterial spot</b>	<i>A hot water seed treatment will help prevent bacterial spot. Place the seed in a mesh bag and dip it into water heated to 122°F. Treat seed for 25 minutes. Immediately transfer the bag to cold water to cool the seed. There will be some reduction in the germination rate of treated seed. You may wish to sow additional seed to compensate.</i>			
	fixed copper	3.0–4.0 lb Tri-Basic Copper Sulfate	0	Use disease-free plants. Only certified disease-free transplants should be used. Spray every 7 days in the plant bed and continue to spray in the field. Before transplanting, examine transplants carefully for bacterial spot lesions on the leaves and stems, especially when using southern-grown transplants.
		2.0 qt Top Cop Tri-Basic	0	
		2.0–4.0 lb Kocide 77WP	0	
		2.0–4.0 lb Champion 77WP	0	
		1.3–2.6 pt Champ Formula 2 4.6F	0	
		2.0–4.0 lb Kocide DF	0	
		2.6–5.3 pt Kocide LF 2.4F	0	
		1.5 lb Kocide 2000 DF	0	
	0.75–1.75 lb Kocide 3000	0		
	streptomycin sulfate	200 ppm streptomycin	0	Spray every 4–5 days in the seedbed up to transplanting.
<b>Blossom-end rot</b>	<i>Maintain uniform moisture supply by mulching and irrigating. Avoid excessive use of ammonia nitrogen and highly soluble potassium salts. Also work a superphosphate fertilizer or hydrated lime into the soil before planting. Do not cultivate too close to plants.</i>			
<b>Botrytis (gray mold)</b>	<i>Cultural management in greenhouses: keep ventilators partly open while the outside temperature is at least 45°F. This practice reduces relative humidity and the duration of periods favorable to spread of the fungus.</i>			
<b>Early blight and Botrytis (gray mold)</b>	boscalid	early blight: 2.5–3.5 oz Endura	0	Endura belongs to the Group 7 fungicide category. If used alone, Endura does not control late blight. Use only in a tank mix with a broad-spectrum fungicide. Do not make more than 2 sequential applications of Endura before switching to a fungicide having a different mode of action. Do not make more than 6 applications of Endura per growing season. Do not exceed 21.0 oz/a per season when treating for early blight or 25.0 oz/a per season when treating for gray mold.
		Botrytis (gray mold): 9.0–12.5 oz Endura		
	pyrimethanil	7.0 fl oz Scala SC in combination with a broad-spectrum fungicide	1	Scala SC belongs to the Group 9 fungicide category. Use only in a tank mix with a broad-spectrum fungicide. Alternating the tank-mix combination with a broad-spectrum fungicide is a resistance management strategy.  Scala SC can be used in a well-ventilated plastic tunnel house or glass house. Ventilate for at least 2 hours after application.
<b>Fruit anthracnose</b>	<i>See Septoria leaf blight for chemical recommendations. When conditions are favorable for fruit anthracnose, use higher label rates of chlorothalonil formulations.</i>			
<b>Fusarium and Verticillium wilts</b>	<i>Plant only wilt-resistant varieties and follow a rotation that does not include wilt-susceptible crops.</i>			
	metam-sodium	Vapam HL		
<b>Late blight</b>	ametoctradin + dimethomorph	14.0 fl oz Zampro	4	Do not apply more than 2 sequential applications of Zampro. Alternate to a fungicide with a different mode of action. Also targets <i>Phytophthora capsici</i> (crown and fruit rot).
	cyazofamid	2.1–2.75 fl oz Ranman 400SC	0	Do not apply more than six sprays or 16.5 fl oz/a 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.

(continued)

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Sweet corn

Table beet

Tomato

## Disease control in tomato *(continued)*

Disease	Active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
<b>Late blight</b> <i>(cont.)</i>	cymoxanil	3.2–5.0 oz Curzate 60DF	3	If late blight is present, use the 5.0 oz rate. Use only in combination with a labeled rate of a protectant fungicide, such as mancozeb, chlorothalonil, or copper hydroxide.
	dimethomorph	6.0 oz Forum	0	Begin treatment before the onset of late blight. Apply every 7–10 days; when cool, wet conditions are conducive for disease or when late blight has been detected in a field or nearby, apply every 5–7 days. Forum must be used in a tank mix with other protectant fungicides other than mefenoxam or metalaxyl. Do not exceed 30.0 oz/a Forum per season.
	fixed copper	2.6–4.0 pt Kocide LF 2.4F	0	Begin treatment before symptoms appear.
		0.75–1.75 lb Kocide 3000	0	
		1.5 lb Kocide 2000 DF	0	
		2.0–3.0 lb Kocide 101, DF	0	
		3.0–4.0 lb Tri-Basic Copper Sulfate	0	
	fluopicolide	3.0–4.0 fl oz Presidio	2	Tank mix this product with another labeled non-Group 43 fungicide.
	mandipropamid	5.5–8.0 fl oz Revus	1	Do not apply more than 32.0 fl oz/a per season. Begin application prior to disease onset. The addition of a spreading/penetrating adjuvant is recommended.
	mandipropamid/ difenoconazole	5.5–7.0 fl oz Revus Top	1	Make no more than 2 consecutive applications before switching to another non-Group 40/3 fungicide. Do not exceed 28.0 fl oz/a Revus Top per season.
oxathiapiprolin	2.0–4.8 fl oz Orondis Opti A, Orondis Ultra A 2.4–19.2 fl oz Orondis Gold 200	0	Begin foliar applications prior to disease development. Do not exceed 4.8 fl oz/a per treatment, or 19.2 fl oz/a per year. 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.	
potassium phosphite	1.0–3.0 qt Fosphite/100 gal water	0	Do not apply Fosphite at intervals less than 3 days. Do not apply to plants that are heat- or moisture-stressed.	
propamocarb hydrochloride	0.7–1.5 pt Previcur Flex	5	Begin treatment before the onset of late blight. Tank mix with other fungicides such as chlorothalonil, maneb, or mancozeb. Adjust rates and timing according to late blight conditions. Do not exceed 7.5 pt/a Previcur Flex per growing season.	
<b>Leaf mold (Fulvia blight)</b>	<i>Leaf mold is a very common foliar disease of tomato grown in greenhouses or high tunnels. Varietal resistance can aid in management. Plant spacing for airflow and dry foliage is important.</i>			

*(continued)*

**Disease control in tomato** (continued)

Disease	Active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions			
<b>Leaf mold</b> (cont.)	fixed copper	3.0–4.0 lb Tri-Basic Copper Sulfate	0	Use disease-free plants. Only certified disease-free transplants should be used. Spray every 7 days in the plant bed and continue to spray in the field. Before transplanting, examine transplants carefully for bacterial spot lesions on the leaves and stems, especially when using southern-grown transplants.			
		2.0 qt Top Cop Tri-Basic	0				
		2.0–4.0 lb Kocide 77WP	0				
		2.0–4.0 lb Champion 77WP	0				
		1.3–2.6 pt Champ Formula 2 4.6F	0				
		2.0–4.0 lb Kocide DF	0				
		2.6–5.3 pt Kocide LF 2.4F	0				
		1.5 lb Kocide 2000 DF	0				
		0.75–1.75 lb Kocide 3000	0				
		azoxystrobin + difenoconazole	8.0 fl oz Quadris Top		0	Follow resistance management guidelines.	
difenoconazole + cyprodinil	16.0–20.0 fl oz Inspire Super	0	Follow resistance management guidelines. Label doesn't limit greenhouse use.				
famoxadone + cymoxanil	6.0–8.0 oz Tanos	3	Follow resistance management guidelines. Label does not limit greenhouse use.				
mancozeb	1.2–1.6 qt Dithane DF Rainshield, Dithane F-45 1.5–3.0 lb Dithane M45 0.75–1.0 lb Koverall 0.75–1.5 lb Manzate Pro-Stick	3	Do not apply more than 11.2 qt per acre per crop. Can be used in greenhouse or high tunnel.				
				<b>Seed rot, root rot, and damping-off</b>	captan		Plant seed treated with Captan or Thiram fungicide.
					thiram		
					fosetyl-al	2.5–5.0 lb Aliette, Linebacker	14
<b>Septoria leaf blight, early blight, and late blight</b>	azoxystrobin	6.2 fl oz Aframe, Equation, Quadris Flowable, Satori	14	Equation, Quadris, Satori, Tanos, Reason, and Evito belong to the Group 11 (strobilurin) fungicide category. Quadris Opti contains a combination of Groups 11 and M5 fungicides. Do not exceed 1 application of any of these Group 11 products before alternating with a fungicide having a different mode of action. Do not exceed 4 applications of Evito or 6 applications of other Group 11 fungicides per year. Do not exceed 22.8 fl oz/a Evito; 1.0 qt/a Equation, Quadris, or Satori; 1.0 gal/a Quadris Opti, 24.6 fl oz/a Reason, or 72.0 oz/a Tanos per season.			
	azoxystrobin + chlorothalonil	1.6 pt Quadris Opti	0				
	azoxystrobin + difenoconazole	8.0–14.0 fl oz Quadris Top	0				
	cymoxanil + famoxadone	early blight: 6.0–8.0 oz Tanos 50DF	3				
		late blight, fruit anthracnose: 8.0 oz Tanos 50DF	3		Following the last application of Reason 500 SC, wait 30 days before rotating to wheat and 1 year for all other crops.		
	fenamidone	5.5–8.2 fl oz Reason 500 SC	14		Do not apply Equation, Quadris, Satori, or Tanos with an adjuvant. Do not apply Equation, Quadris, Satori, or Tanos until 21 days after transplanting or 35 days after seeding.		
fluoastrobilin	3.8–5.7 fl oz Evito 480 SC, Aftershock	3	Do not apply Equation, Quadris, Satori, or Tanos within 6 days before or after a postemergence application of metribuzan herbicide.  Tanos must be tank mixed with a contact fungicide having a different mode of action.				

(continued)

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## Disease control in tomato *(continued)*

	Disease	Active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions		
Pea	<b>Septoria leaf blight, early blight, and late blight</b> <i>(cont.)</i>	chlorothalonil	1.3–1.8 lb Bravo Ultrex	0	Begin spraying when the first fruit clusters start to develop and continue on a 7-day schedule throughout the season. Do not exceed 15.1 lb ai/a chlorothalonil per season. Adjust spray intervals when conditions favor disease development.		
			82.5WDG, Equus DF	0			
			1.375–2.0 pt Bravo	0			
			Weather Stik, Echo 720, Equus 720	0			
			1.2–1.7 lb Echo 90DF	0			
Pepper		chlorothalonil + cymoxanil	2.0–3.0 pt Echo Zn	0	Apply before infection but when conditions occur to favor disease.		
			2.0–2.75 pt Bravo Zn	0			
			1.9–2.8 pt Equus 500 Zn	0			
			1.9–3.0 pt Ariston	3			
			cyprodinil + difenoconazole	<i>Septoria leaf blight, early blight:</i> 16.0–20.0 fl oz Inspire Super		0	Also targets leaf mold ( <i>Fulvia fulvum</i> ) common in high tunnels and greenhouses. Do not apply more than 47.0 fl oz/a season. Do not use on varieties of tomatoes in which mature fruit are less than 2 inches (such as cherry or grape).
Potato		cyprodinil + fludioxonil	<i>early blight:</i> 11.0–14.0 oz Switch 62.5WG	0	Do not apply more than 56.0 oz/a per year. Do not apply to small tomatoes such as cherry- or grape-type tomatoes in the greenhouse.		
			fluxapyroxad + pyraclostrobin	4.0–8.0 fl oz Priaxor	7	Do not mix Priaxor with emulsifiable concentrate (EC) formulation or solvent-based formulation products, or crop oil concentrate, methylated seed oil, organosilicone, or MSO/OS blended adjuvant products. Do not make more than 2 applications before alternating to a fungicide with a different mode of action.	
				hydrogen dioxide	1:100–1:2000 OxiDate dilution rate	0	Can be used on certified organic farms. Multiple use patterns for tomato. See label for details.
Pumpkin & squash		mancozeb	0.6–2.4 qt Penncozeb 4FL, Manzate Flowable	5	Consult label for product use limits. Spray every 5–10 days depending on disease and weather pressures.		
			1.2–2.4 qt Dithane F-45	5			
			0.75–1.5 lb Koverall	5			
			0.75–3.0 lb Penncozeb 75DF, 80WP	5			
			1.0–2.0 lb Manzate Pro-Stick	3			
Sweet corn		mancozeb	1.5–3.0 lb Dithane DF Rainshield	5			
			penthiopyrad	10.0–24.0 fl oz Fontelis		0	Make no more than 2 sequential applications before switching to a fungicide with a different mode of action. Do not exceed 72.0 fl oz/a per year.
			pyraclostrobin	<i>early blight, fruit anthracnose, Septoria leaf blight:</i> 8.0–12.0 oz Cabrio EG		0	
<i>late blight:</i> 8.0–16.0 oz Cabrio EG	0						
Table beet		trifloxystrobin	<i>Septoria suppression:</i> 3.0–3.8 fl oz Gem 500 SC 3.0–4.0 oz Flint <i>late blight:</i> 3.8 fl oz Gem 500 SC 4.0 oz Flint and tank mix with 75% of labeled rate of a protectant fungicide	3	Do not apply more than 16.0 oz/a per season. Do not apply more than 5 applications/a per season. Alternate every Group 11 application with at least one application from a different group.		

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**Disease control in tomato** (continued)

Disease	Active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
<b>Septoria leaf blight, early blight, and late blight</b> (cont.)	zoxamide + chlorothalonil	36.0 fl oz Zing	5	Follow resistance management guidelines.
	zoxamide + mancozeb	1.5–2.0 lb Gavel 75DF	5	Do not make more than 4 applications or apply more than 8.0 lb/a product (5.33 lb ai mancozeb or 0.66 lb zoxamide) per season. See label for other diseases controlled.
<b>Soil rot</b>	Avoid by staking or mulching plants.			
<b>Walnut wilt</b>	Symptoms are similar to <i>Fusarium</i> wilt. Plant tomatoes at a distance from the base of black walnut trees that is greater than the tree height.			
<b>White mold</b> ( <i>Sclerotinia sclerotiorum</i> )	<i>Coniothyrium minitans</i>	1.0–4.0 lb Contans WG	0	Broadcast apply into top 2 inches of soil and incorporate with light mechanical incorporation or irrigation. See label for additional use patterns. Can be used in greenhouses and high-tunnel structures.

**Scouting calendar for insect pests of tomato**

April			May			June			July			August			September			
early	mid	late	early	mid	late	early	mid	late	early	mid	late	early	mid	late	early	mid	late	
			Black cutworm															
			Flea beetles															
									Variegated cutworm									
									Tomato hornworm (European corn borer)									

**Insect control in tomato**

Insect	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
<b>Aphids</b>	acetamiprid	0.8–1.2 oz Assail 70WP	7	Begin treatment when thresholds are reached. Apply every 7 days as needed. Do not exceed 6.8 oz/a Assail 70WP or 16.0 oz/a Assail 30 SG per season.
		2.0–4.0 oz Assail 30 SG	7	
	alpha-cypermethrin	3.2–3.8 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.
	0.025–0.044 lb beta-cyfluthrin	1.6–2.8 fl oz *Baythroid XL	0	Ground applications only.
	0.033–0.08 lb bifenthrin	2.1–5.2 fl oz *Brigade 2EC	1	Do not exceed 4 applications per season.
	0.06–0.15 lb bifenthrin + imidacloprid	3.8–9.85 fl oz *Brigadier	1	Do not apply more than 30.72 fl oz/a (0.48 lb ai/a) per season. No more than 0.32 lb ai/a bifenthrin and 0.24 lb ai/a imidacloprid are allowed per season.
	clothianidin	foliar: 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.
		soil: 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.

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## Insect control in tomato *(continued)*

Insect	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
<b>Aphids</b> <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.
	0.088–0.133 lb cyantraniliprole ( <i>foliar</i> )	13.5–20.5 fl oz Exirel	1	
				Minimum application interval between foliar sprays is 5 days.
	0.018–0.028 lb deltamethrin	1.5–2.4 fl oz *Delta Gold	1	Apply every 5 days as needed. Do not exceed 14.4 fl oz/a Delta Gold.
	0.045–0.268 lb dinotefuran	<i>foliar</i> : 1.0–4.0 oz Venom 70SG <i>soil</i> : 5.0–6.0 oz Venom 70SG	1 21	Do not follow soil applications with foliar application of any other neonicotinoid insecticide. Use only one application method. Do not apply more than 6.0 oz/a per year using foliar applications, or 12.0 oz/a per season using soil applications. See product label for application directions. Do not apply to tomatoes less than 2 inches tall.
	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. Use only one application method.
	0.23–0.27 lb dinotefuran ( <i>soil</i> )	9.0–10.5 oz Scorpion 35SL	21	Do not apply more than 21.0 oz per year. Use only one application method.
	0.25–0.5 lb dimethoate	0.5–1.0 pt Dimethoate EC	7	
	0.2 lb fenpropathrin	10.67 oz *Danitol 2.4EC	3	Do not exceed 2.66 pt/a Danitol (0.8 lb ai/a) per season. Control may be improved by the addition of a non-ionic surfactant.
	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 per application or 8.4 oz/a (0.267 lb ai/a) per season.
	flupyradifurone	<i>foliar</i> : 7.0–12.0 fl oz Sivanto <i>soil</i> : 21.0–28.0 fl oz Sivanto	1 45	Apply when pests reach or exceed established thresholds. Do not apply more than 28.0 fl oz of Sivanto per acre per crop season.
	imidacloprid	7.0–10.5 fl oz Admire Pro	21	Systemic at planting. Do not exceed 24.0 fl oz/a Admire per season.
	0.05 lb imidacloprid	Provado 1.6	0	Foliar spray. Also controls whitefly. Do not exceed 18.75 fl oz/a Provado per season.
	imidacloprid + beta-cyfluthrin	3.8–4.1 fl oz *Leverage 360	0	Do not apply more than 12.8 fl oz/a per season and allow at least 7 days between applications.
	0.02–0.03 lb lambda-cyhalothrin	1.28–1.92 fl oz *Warrior II	4	Reapply at intervals of 5 days or more. Do not exceed 0.18 lb ai/a per year.
	lambda-cyhalothrin + chlorantraniliprole	6.0–9.0 fl oz *Voliam Xpress	5	Do not exceed a total of 31.0 fl oz/a of Voliam Xpress or 0.36 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	5	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.
	0.9–1.5 lb malathion	several formulations	1	
	0.75–1.0 lb methamidophos	1.5–2.0 pt *Monitor 4E	7	

\*Restricted-use pesticide.

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**Insect control in tomato** *(continued)*

Insect	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
<b>Aphids</b> <i>(cont.)</i>	0.225–0.9 lb methomyl	0.75–3.0 pt *Lannate LV 0.25–1.0 lb *Lannate SP	1	
	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.
	0.06–0.08 spirotetramat	4.0–5.0 Movento	1	Do not apply more than 10.0 fl oz/a (0.16 lb ai/a) per season.
	thiamethoxam	2.0–3.0 oz Actara 25WDG 5.0–11.0 fl oz Platinum 2SC 1.66–3.67 oz Platinum 75SG	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.
			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.
	zeta-cypermethrin	3.2–4.0 oz *Mustang Maxx	1	Apply every 7 days as needed. Use higher rate for heavy infestations. Do not exceed 24.0 oz/a Mustang Maxx per season.
<b>Cutworms and loopers</b>	<i>Treat when larvae exceed one per 10 plants.</i>			
	alpha-cypermethrin	2.2–3.8 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.
	0.033–0.044 lb beta-cyfluthrin	2.1–2.8 fl oz *Baythroid XL	0	Ground applications only. Apply every 7 days as needed. Do not apply more than 16.8 fl oz/a of Baythroid per season.
	bifenthrin	2.1–5.2 fl oz *Brigade 2EC	1	Do not exceed 4 applications per season.
		3.4–6.8 fl oz *Capture LFR	33	
	0.04–0.15 lb bifenthrin + imidacloprid	5.1–9.85 fl oz *Brigadier	1	Do not apply more than 30.72 fl oz/a (0.48 lb ai/a) per season. No more than 0.32 lb ai/a bifenthrin and 0.24 lb ai/a imidacloprid are allowed per season.
	1.0–2.0 lb carbaryl	Sevin (several formulations)	0	Broadcast bait formulation. Can only be used with mechanical harvest.
	chlorantraniliprole	3.5–7.5 fl oz Coragen	1	Do not make more than 4 applications per crop season and allow at least 5 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.
	0.018–0.028 lb deltamethrin	1.5–2.4 fl oz *Delta Gold	1	Apply every 5 days as needed. Do not exceed 14.4 fl oz/a Delta Gold.

\*Restricted-use pesticide.

*(continued)*

Pea

Pepper

Potato

Pumpkin & squash

Sweet corn

Table beet

Tomato

## Insect control in tomato *(continued)*

	Insect	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Pea	<b>Cutworms and loopers</b> <i>(cont.)</i>	0.0075–0.015 lb emamectin benzoate	2.4–4.8 oz *Proclaim	7	
		0.015–0.05 lb esfenvalerate	2.9–9.6 fl oz *Asana XL	1	Do not exceed 0.5 lb ai/a per season.
Pepper		0.2 lb fenpropathrin	10.67 oz *Danitol 2.4EC	3	Do not exceed 2.66 pt/a Danitol (0.8 lb ai/a) per season. Control may be improved by the addition of a non-ionic surfactant.
		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	1	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.
Potato		imidacloprid + beta-cyfluthrin	3.8–4.1 fl oz *Leverage 360	0	Do not apply more than 12.8 fl oz/a per season and allow at least 7 days between applications.
		0.015–0.025 lb lambda-cyhalothrin	0.96–1.6 fl oz *Warrior II	4	Do not exceed 0.36 lb ai/a per season. Reapply at intervals of 5 or more days.
		lambda-cyhalothrin + chlorantraniliprole	5.0–8.0 fl oz *Voliam Xpress	5	Do not exceed 31.0 fl oz/a of Voliam Xpress or 0.36 lb ai/a of products containing lambda-cyhalothrin or 0.2 lb ai/a of products containing chlorantraniliprole per growing season.
Pumpkin & squash		lambda-cyhalothrin + thiamethoxam	4.0–4.5 fl oz *Endigo ZC	5	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.
		0.06–0.16 lb methoxyfenozide	4.0–10.0 fl oz Intrepid 2F	1	Do not exceed 64.0 fl oz/a per season. Use the higher rates with higher populations or when spray coverage is difficult. See label for use restrictions in some Wisconsin counties.
		0.039–0.063 lb spinetoram	5.0–8.0 oz Radiant SC	7	Do not apply more than 34.0 oz/a Radiant (0.266 lb ai/a) or make more than 6 applications per season.
Sweet corn		spinosad	3.0–6.0 fl oz Entrust SC	1	Use higher rate for larger insects. Do not exceed 0.45 lb ai/a per season. Do not use a buffering agent. Spray thoroughly for control.
		tebufenozide	6.0–16.0 fl oz Confirm 2F	7	Apply per label directions when populations reach threshold levels. Do not exceed 64.0 fl oz ai/a per season. There is a 1–12 month plantback restriction depending on crop.
Table beet		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.
		0.01–0.025 lb zeta-cypermethrin	2.24–4.0 oz *Mustang Maxx	1	Apply at thresholds and do not exceed 24.0 oz/a Mustang Maxx per season.
		0.04–0.1 lb zeta-cypermethrin + bifenthrin	4.0–10.3 fl oz *Hero	1	Do not apply more than 0.42 lb ai/a per season. Wait at least 10 days between applications.

\*Restricted-use pesticide.

*(continued)*

Tomato

**Insect control in tomato** (continued)

Insect	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
<b>Flea beetles</b>	<i>Treat when numbers exceed two beetles per 10 leaves.</i>			
	alpha-cypermethrin	2.2–3.8 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.
	beta-cyfluthrin	2.8 fl oz *Baythroid XL	0	Maximum Baythroid XL allowed per 7-day interval is 2.8 fl oz/a and season total allowed per crop season is 16.8 fl oz/a.
	bifenthrin	2.1–5.2 fl oz *Brigade 2EC	1	Do not exceed 4 applications per season.
		3.4–6.8 fl oz *Capture LFR	33	Do not exceed 0.1 lb ai/a as an at-plant application; do not exceed 0.32 lb ai/a per season of all bifenthrin products.
	0.04–0.15 lb bifenthrin + imidacloprid	5.1–9.85 fl oz *Brigadier	1	Do not apply more than 30.72 fl oz/a (0.48 lb ai/a) per season. No more than 0.32 lb ai/a bifenthrin and 0.24 lb ai/a imidacloprid are allowed per season.
	0.8 lb carbaryl	Sevin	0	Several formulations; see label for rate. Can only be used with mechanical harvest.
	clothianidin	foliar: 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.
		soil: 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.
	0.088–0.176 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.
	0.018–0.028 lb deltamethrin	1.5–2.4 fl oz *Delta Gold	1	Apply every 5 days as needed. Do not exceed 14.4 fl oz/a Delta Gold.
	0.045–0.268 lb dinotefuran	foliar: 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 6.0 oz/a per year using foliar applications, or 12.0 oz/a per season using soil applications. See product label for application directions. Do not apply to tomatoes less than 2 inches tall.
		soil: 5.0–6.0 oz Venom 70SG	21	
	0.05–0.18 lb dinotefuran (foliar)	2.0–7.0 oz Scorpion 35SL	1	Can repeat at 7-day intervals. Do not apply more than 10.5 oz per year. Use only one application method. Do not apply to tomatoes less than 2 inches tall.
	0.23–0.27 lb dinotefuran (soil)	9.0–10.5 oz Scorpion 35SL	21	Do not apply more than 21.0 oz per year. Use only one application method. Do not apply to tomatoes less than 2 inches tall.
0.015–0.05 lb esfenvalerate	2.9–9.6 fl oz *Asana XL	1	Do not exceed 0.5 lb ai/a per season.	
0.01–0.015 lb gamma-cyhalothrin	2.56–3.84 oz *Proaxis	5	Apply every 5 days as needed. Do not apply more than 2.88 pt/a (0.18 lb ai/a) per season.	
imidacloprid	7.0–10.5 fl oz Admire Pro	21	Systemic at planting.	

\*Restricted-use pesticide.

(continued)

Pea

Pepper

Potato

Pumpkin & squash

Sweet corn

Table beet

Tomato

## Insect control in tomato *(continued)*

Insect	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
<b>Flea beetles</b> <i>(cont.)</i>	imidacloprid + beta-cyfluthrin	3.8–4.1 fl oz *Leverage 360	0	Do not apply more than 12.8 fl oz/a per season and allow at least 7 days between applications.
	0.02–0.03 lb lambda-cyhalothrin	1.28–1.92 fl oz *Warrior II	4	Reapply at intervals of 5 days or more. Do not exceed 0.36 lb ai/a per year.
	lambda-cyhalothrin + chlorantraniliprole	6.0–9.0 fl oz *Voliam Xpress	5	Do not exceed a total of 31.0 fl oz/a of Voliam Xpress or 0.36 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	5	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.
	thiamethoxam	2.0–3.0 oz Actara 25WDG 5.0–11.0 oz Platinum 2SC 1.66–3.67 oz Platinum 75SG	0 30 30	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.
	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.
	0.01–0.025 lb zeta-cypermethrin	2.24–4.0 oz *Mustang Maxx	1	Apply every 7 days as needed. Use higher rate for heavy infestations. Do not exceed 24.0 oz/a Mustang Maxx per season.
	0.04–0.1 lb zeta-cypermethrin + bifenthrin	4.0–10.3 fl oz *Hero	1	Do not apply more than 0.42 lb ai/a per season. Wait at least 10 days between applications.
<b>Hornworm and tomato fruitworm</b>	<i>Treat when there is an average of at least two hornworms per plant.</i>			
	alpha-cypermethrin	2.2–3.8 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.
	<i>Bacillus thuringiensis</i>	DiPel DF, Javelin, MVP	0	Rates vary with formulation. Apply when larvae are small.
	<i>Bacillus thuringiensis</i> subsp. <i>kurstaki</i>	1.0–2.0 lb Lepinox WDG	0	Treat early instar larvae before noticeable feeding damage occurs. Repeat as needed.
	0.025–0.044 lb beta-cyfluthrin	1.6–2.8 fl oz *Baythroid XL	0	Ground applications only. Apply every 7 days as needed. Do not apply more than 16.8 fl oz/a of Baythroid XL per season.
	0.033–0.08 lb bifenthrin	2.1–5.2 fl oz *Brigade 2EC	1	Do not exceed 4 applications per season.
	0.04–0.15 lb bifenthrin + imidacloprid	5.1–9.85 fl oz *Brigadier	1	Do not apply more than 30.72 fl oz/a (0.48 lb ai/a) per season. No more than 0.32 lb ai/a bifenthrin and 0.24 lb ai/a imidacloprid are allowed per season.
	0.5–2.0 lb carbaryl	Sevin (several formulations)	0	Can only be used with mechanical harvest.
	chlorantraniliprole	3.5–7.5 fl oz Coragen	1	Do not make more than 4 applications per crop season and allow at least 5 days between applications. Do not apply more than 15.4 fl oz/a Coragen per season.

\*Restricted-use pesticide.

*(continued)*

**Insect control in tomato** *(continued)*

Insect	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
<b>Hornworm and tomato fruitworm</b> <i>(cont.)</i>	0.065–0.130 lb cyantraniliprole <i>(soil)</i>	5.0–10.0 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.
	0.045–0.088 lb cyantraniliprole <i>(foliar)</i>	7.0–13.5 fl oz Exirel	1	
	0.012–0.028 lb deltamethrin	1.0–2.4 fl oz *Delta Gold	1	Apply every 5 days as needed. Do not exceed 14.4 fl oz/a Delta Gold.
	0.0075–0.015 lb emamectin benzoate	2.4–4.8 oz *Proclaim	7	
	0.015–0.05 lb esfenvalerate	2.9–9.6 fl oz *Asana XL	1	Do not exceed 0.5 lb ai/a per season.
	0.2 lb fenpropathrin	10.67 oz Danitol 2.4EC	3	Do not exceed 2.66 pt/a Danitol (0.8 lb ai/a) per season. Control may be improved by the addition of a non-ionic surfactant.
	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	1	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.
	0.0075–0.0125 lb gamma-cyhalothrin	1.92–3.20 oz *Proaxis	5	Apply every 5 days as needed. Do not apply more than 2.88 pt/a (0.18 lb ai/a) per season.
	imidacloprid + beta-cyfluthrin	3.8–4.1 fl oz *Leverage 360	0	Do not apply more than 12.8 fl oz/a per season and allow at least 7 days between applications.
	0.045–0.065 lb indoxacarb	2.5–3.5 oz Avaunt	3	Apply when insect populations reach threshold levels. May repeat treatment every 5 days. Do not apply more than 0.26 lb ai/a per crop. Apply higher rate for tomato fruitworm control.
	0.015–0.025 lb lambda-cyhalothrin	0.96–1.6 fl oz *Warrior II	4	Reapply at intervals of 5 days or more. Do not exceed 0.36 lb ai/a per year.
	lambda-cyhalothrin + chlorantraniliprole	5.0–8.0 fl oz *Voliam Xpress	5	Do not exceed a total of 31.0 fl oz/a of Voliam Xpress or 0.36 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	5	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.
	0.225–0.9 lb methomyl	0.75–3.0 pt *Lannate LV 0.25–1.0 lb *Lannate SP	1	
	0.16–0.25 lb methoxyfenozide	10.0–16.0 fl oz Intrepid 2F	1	Do not exceed 64.0 fl oz/a per season. Use the higher rates with higher populations or when spray coverage is difficult. See label for use restrictions in some Wisconsin counties. May only provide partial control of fruitworms in heavy infestations.
	0.05–0.2 lb permethrin	*Ambush, *Pounce	0	Several formulations; see label for rate and seasonal use limits. Do not apply to cherry tomatoes.

\*Restricted-use pesticide.

*(continued)*

Pea

Pepper

Potato

Pumpkin & squash

Sweet corn

Table beet

Tomato

## Insect control in tomato *(continued)*

Insect	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
<b>Hornworm and tomato fruitworm</b> <i>(cont.)</i>	0.039–0.063 lb spinetoram	5.0–8.0 oz Radiant SC	7	Do not apply more than 34.0 oz/a Radiant (0.266 lb ai/a) per crop and do not make more than 6 applications per crop.
	spinosad	3.0–6.0 fl oz Entrust SC	1	Use higher rate for larger insects. Apply adequate spray to get good coverage for best control. Do not exceed 0.45 lb ai/a per season. Do not use a buffering agent.
	0.09–0.25 lb tebufenozide	6.0–16.0 fl oz Confirm 2F	7	Apply per label directions when populations reach threshold levels. Do not exceed 64.0 fl oz ai/a per season. There is a 1–12 month plantback restriction depending on crop.
	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.
	0.01–0.025 lb zeta-cypermethrin	2.24–4.0 oz *Mustang Maxx	1	Apply every 7 days as needed. Use higher rate for heavy infestations. Do not exceed 24.0 oz/a Mustang Maxx per season.
	0.04–0.1 lb zeta-cypermethrin + bifenthrin	4.0–10.3 fl oz *Hero	1	Do not apply more than 0.42 lb ai/a per season. Wait at least 10 days between applications.
<b>Spider mite</b>	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	Limit one application per season.
	0.033–0.08 lb bifenthrin	2.1–5.2 fl oz *Brigade 2EC	1	Do not exceed 4 applications per season.
	0.2 lb fenpropathrin	10.66 fl oz Danitol 2.4EC	3	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	5	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.
	1.5–2.0 lb malathion	several formulations	1–5	
	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.
	0.1 lb zeta-cypermethrin + bifenthrin	10.3 fl oz *Hero	1	Do not apply more than 0.42 lb ai/a per season. Wait at least 10 days between applications.

\*Restricted-use pesticide.

Pea

Pepper

Potato

Pumpkin & squash

Sweet corn

Table beet

Tomato

## Weed control in tomato

Weed	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Annual weeds	0.48–1.43 lb pendimethalin	1.0–3.0 pt Prowl H <sub>2</sub> O	21	Apply as a broadcast preplant-incorporated application, or as a broadcast preplant surface application before transplanting, or as a post-directed application to transplanted or established direct-seeded tomatoes. Do not apply postemergence over the top of or to foliage of tomatoes. Use rate varies by soil type. Do not apply more than 3.0 pt/a per season. Do not allow treated soil to come in contact with the transplant area.
	s-metolachlor	1.0–2.0 pt Dual Magnum or Dual II Magnum	varies	<b>Transplanted tomatoes:</b> Apply as a preplant-incorporated, preplant before transplanting, or post-directed following the first settling rain or irrigation. Dual Magnum may also be used under plastic mulch or to treat row middles in bedded tomatoes. Dual Magnum will not control emerged weeds. Adjust rate according to soil texture and expected weed pressure. Do not apply to cultivars with unknown tolerance. Preharvest interval varies with application rate. Consult label for specific rate-dependent preharvest intervals. See label for additional directions and precautions.
	0.07–0.25 lb sulfentrazone	2.25–8.0 oz Spartan 4F		Pre-transplant broadcast or banded applications to transplanted tomatoes only. Use rate is based on soil texture and organic matter. Do not apply to soils classified as sand with less than 1% organic matter.
Annual grasses and some broadleaves	4.5–10.5 lb DCPA	6.0–14.0 lb Dacthal W-75 6.0–14.0 pt Dacthal FL		Make preemergence applications to weed-free soil 4–6 weeks after transplanting and to seeded tomatoes when they are 4–6 inches tall. Use only on soils with 5% or less organic matter.
	1.0–2.0 lb napropamide	2.0–4.0 lb Devrinol DF-XT 2.0–4.0 qt Devrinol 2-XT		Apply before planting to a weed-free soil surface. Incorporate 1–2 inches deep the same day. Napropamide can be applied to direct-seeded or transplanted tomatoes.
	trifluralin	several manufacturers		For transplants, apply and incorporate before transplanting or apply post-plant as a directed spray to the soil between the rows and beneath plants and incorporate. On direct-seeded tomatoes, apply as a directed spray between rows and under plants at thinning. May cause early stunting of tomatoes, especially under poor growing conditions.  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.

\*Restricted-use pesticide.

(continued)

Pea

Pepper

Potato

Pumpkin & squash

Sweet corn

Table beet

Tomato

## Weed control in tomato *(continued)*

Weed	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
Pea	metribuzin	<i>preplant-incorporated</i>	7	Incorporate 2–4 inches deep before transplanting.
		<i>postemergence broadcast</i>	7	For postemergence broadcast spray to established tomatoes, apply before weeds are 1 inch tall. Minimum of 14 days between applications. Do not treat seeded tomatoes until they have five to six leaves. Do not apply until transplants have recovered from transplant shock and new growth is evident. Do not apply within 3 days after cool, wet, or cloudy weather, or injury may result. Do not apply within 24 hours of other chemical treatments.
		<i>postemergence directed</i>	7	Use postemergence directed spray application on fields with a history of severe weed pressure or fields infested with hard-to-kill weeds. Use in limited trials on new varieties. If making multiple applications, do not exceed the maximum annual rate. See label for additional precautions on this use.
Potato	0.0156–0.624 lb rimsulfuron	<i>preemergence</i> : 2.0–4.0 oz Matrix or Solida	45	Requires rainfall or irrigation for activation; see label for timing and amount. For postemergence applications, use 1.0–2.0 oz/a product to control young, actively growing weeds. See label for adjuvant instructions. Do not exceed 4.0 oz/a per season.
		<i>postemergence</i> : 1.0–2.0 oz Matrix or Solida	45	
Pumpkin & squash	0.023–0.047 lb halosulfuron	0.5–1.0 oz Sandea (rate varies by crop use and application timing—see label)	30	Sandea controls several broadleaf weeds and nutsedge, but no grasses. Sandea has both pre- and postemergence activity and can be used under plastic mulch. A broadcast postemergent treatment can be sprayed 14 days after transplanting but before first bloom, or directed between rows of a seeded or transplanted crop at any time. If plastic is used on the planted row, adjust equipment to keep spray off the plastic. Do not exceed two applications or apply more than 2.0 oz/a per crop cycle or 12-month period. Soil or foliar applications of organophosphate insecticides to Sandea-treated crops may cause severe crop injury. <b>Consult label for additional usage information and other precautions.</b>
Sweet corn	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 planting. If allowed, glyphosate may be applied any time before crop emerges. If preemergence application is allowed, apply before crop seed germination in coarse sandy soils. 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. Do not make hooded or shielded applications to row middles on sandy soils.

\*Restricted-use pesticide.

*(continued)*

**Weed control in tomato** *(continued)*

Weed	Rate/a of active ingredient	Rate/a of commercial product	Days to harvest	Remarks and suggestions
<b>Emerged weeds</b> <i>(cont.)</i>	*paraquat	several manufacturers and formulations— not all are registered for this use	30	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 pre-emergence (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. Up to three directed/shielded treatments may be made per season using precision equipment to prevent spray contact with the crop. Always add crop oil concentrate or non-ionic surfactant to spray mixture. Follow precautions on label.
<b>Emerged grasses</b>	0.068–0.24 lb clethodim	9.0–32.0 oz Select Max	20	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.
	0.094–0.25 lb clethodim	6.0–16.0 oz Select 2EC	20	
	0.094–0.28 lb sethoxydim	0.5–1.5 pt Poast	20	Make postemergence applications to actively growing grasses within the size ranges indicated on the label. Check the label for other (wild proso millet, rescue) treatment rates. Do not apply more than 4.5 pt/a Poast in one crop season. Always add 2.0 pt/a of crop oil concentrate. Follow precautions on label, including tank mix restrictions.

\*Restricted-use pesticide.

Pea

Pepper

Potato

Pumpkin & squash

Sweet corn

Table beet

Tomato