

# Chapter 16. Strawberry Production<sup>1</sup>

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## Botany and Planting

**Strawberry**—*Fragaria* × *ananassa*, Rosaceae.

Table 1. Planting information for strawberries.

| Planting Dates                    |                |
|-----------------------------------|----------------|
| North Florida                     | Sept 15–Oct 15 |
| Central Florida                   | Sept 25–Oct 25 |
| South Florida                     | Oct 1–Nov 1    |
| Planting Information (2-Row Beds) |                |
| Distance between beds (in)        | 48–60          |
| Distance between plants (in)      | 12–16          |
| Distance between rows (in)        | 12–14          |
| Days to first ripe fruit          | 25–50          |
| Plant populations (acre)          | 16,000–22,000  |

## Cultivars

### Main Cultivars

**Florida Brilliance.** Released in 2017. Large fruit size; uniform conic shape with no elongated fruit in the early season; very firm with excellent shelf life; externally very glossy red; light red internally; moderately resistant to rain damage; balanced flavor. The plant is robust but not overly vigorous; is upright with long stems allowing ease of harvest; and does not require high N applications as ‘Florida Radiance’ and ‘Florida Beauty’ do. Fruit can develop weak skin during hot periods in mid-late season, and both N

rates and irrigation volumes should be reduced to counteract this possible problem. Recommended planting dates in central Florida are Oct. 1–15. Resistant to anthracnose fruit rot and Colletotrichum crown rot; moderately susceptible to angular leaf spot; moderately susceptible to Botrytis fruit rot; moderately resistant to powdery mildew and charcoal rot; susceptible to Phytophthora root rot. Ridomil and phosphite applications are highly recommended.

**Sweet Sensation® Florida127.** Released in 2013. Large fruit size; moderately uniform conic to broad-conic fruit; bright-red with lighter color than other cultivars. During cool weather a longer interval between harvests compared to other cultivars is usually necessary to allow optimum color development. Exceptional flavor throughout season; 1.0 to 1.5 degree Brix higher and slightly lower acidity than ‘Florida Brilliance’; susceptible to rain damage. The plant is vigorous, which may be an advantage in north Florida but in central Florida will require reduced nutrient applications early in the season and/or later planting dates to maintain a small plant size. Recommended planting dates in central Florida are Oct. 15–25. Resistant to anthracnose fruit rot and Colletotrichum crown rot; moderately resistant to charcoal rot (caused by *Macrophomina phaseolina*); moderately susceptible to angular leaf spot; susceptible to Botrytis fruit rot and powdery mildew (caused by *Podosphaera aphanis*); highly susceptible to Phytophthora root rot.

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## Minor Cultivars

**Florida Radiance.** Released in 2008. Medium size; uniform, conic fruit with glossy appearance; glossy-red external color and medium-red internal color; moderately acidic but balanced flavor; moderately firm with good shipping quality; flexible skin that is resistant to rain damage. Low to medium plant vigor with open canopy; long fruit stems giving excellent picking efficiency. Moderately resistant to anthracnose fruit rot and *Colletotrichum* crown rot; moderately susceptible to angular leaf spot, with symptoms particularly noticeable on the calyx; susceptible to *Botrytis* fruit rot; highly susceptible to *Phytophthora* root rot—take precautions against *Phytophthora* as recommended for ‘Florida Radiance’. With earlier planting dates, exposure to high temperatures during the establishment period can result in the development of elongated or “bullet” fruit in the early harvest until mid-December. This problem will be reduced with planting dates closer to the middle of October.

**Florida Beauty.** Released in 2016. Medium fruit size, excellent conic shape and even red color; exceptional flavor throughout season, second only to Sweet Sensation® ‘Florida127’; excellent resistance to rain damage. This cultivar is day-neutral and has very early onset of flowering; it is recommended to trim bloom after establishment and a second time when trimming leaves, a practice that produces larger fruit size and quality throughout the season. In central Florida, early and total yields are similar to ‘Florida Radiance’. Recommended planting dates in central Florida are Sept 25–Oct 5. Even earlier planting dates may help to produce a vigorous plant in north Florida. In all regions, high early-season N rates similar to ‘Florida Radiance’ are recommended because the plant is not as vigorous as ‘Florida Brilliance’ or Sweet Sensation®. Susceptible to anthracnose fruit rot and *Colletotrichum* crown rot; susceptible to *Botrytis* fruit rot and powdery mildew; moderately resistant to *Phytophthora* root rot.

Table 2. Herbicides approved for managing weeds in strawberry.

| Active Ingredient<br>lb a.i./Acre  | Trade Name<br>Product/Acre   | MOA<br>Code | Weeds Controlled/Remarks   |
|--|--|-------------|--|
| <b>Labels change frequently. Be sure to read a current product label before applying any chemical.</b> |  |             |  |
| <b>***PRETRANSPLANT***</b>   |  |             |  |
| <b>Acifluorfen</b><br>up to 0.375  | (Ultra Blazer)<br>1.5 pt   | 14          | Broadleaves. May be applied under the plastic mulch or with a shielded or hooded spray directed to row middles. 60 day PHI.  |
| <b>Carfentrazone</b><br>up to 0.031  | (Aim) 2.0 EC<br>up to 2 fl oz  | 14          | Broadleaves. Apply as a preplant burndown for emerged broadleaves up to 4 inches tall or rosettes less than 3 inches across. Good coverage is essential. A nonionic surfactant, methylated seed oil, or crop oil concentrate is recommended. No pretransplant interval.                        |
| <b>Flumioxazin</b><br>0.1  | (Chateau) 51 WDG<br>3 oz   | 14          | Broadleaves. May be applied under the plastic mulch or with a shielded or hooded spray directed to row middles before weed emergence. 30-day pretransplant interval If applied under the plastic mulch. Do not apply after fruit set.  |
| <b>Glyphosate</b>  | (various formulations)<br>consult labels   | 9           | Emerged broadleaves and grasses. Apply as a preplant burndown. Consult label for individual product directions.  |
| <b>Napropamide</b><br>4  | (Devrinol) 2-XT<br>1–2 gallons<br>(Devrinol DF XT) 50 DF<br>4–8 lb                 | 15          | Annual broadleaves and grasses. Apply under the plastic and in the row middles. Mechanically incorporate in the row middle to a 1–2 in. depth within 24 hours of application. When applied under plastic, incorporate mechanically or with irrigation. Do not apply between bloom and harvest. |
| <b>Oxyfluorfen</b><br>0.25–0.5   | (Galigan H2O, GoalTender) 4 EC<br>0.5–1.0 pt<br>(Collide, Goal 2XL) 2 EC<br>1–2 pt | 14          | Broadleaves. Apply pretransplant just prior to installation of plastic mulch. 30-day pretransplant interval. Mulch may be applied any time during the 30-day interval.   |
| <b>Pelargonic acid</b>   | (Scythe) 4.2 EC<br>3%–10% v/v  | 27          | Emerged broadleaves and grasses. Apply as a preplant burndown treatment or post-transplant with shielded or hooded sprayers. Product is a contact, nonselective, foliar-applied herbicide with no residual control.  |
| <b>Pendimethalin</b><br>0.72   | (Prowl H2O) 3.8<br>1.5 pt  | 3           | Broadleaves and grasses, in the row middles. Do not apply under the plastic. In systems that use irrigation at planting, delay application until after irrigation regime. 35-day PHI.  |
| <b>Sulfentrazone</b><br>0.125  | (Spartan FL) 4F<br>4 oz  | 14          | Broadleaves, grasses, and nutsedge. Apply under the plastic mulch or in row middles. Do not use on soils with less than 1% organic matter.   |
| <b>Terbacil</b><br>0.2   | (Sinbar WDG) 80 WDG<br>4 oz  | 3           | Broadleaves, grasses and some sedges. One application per crop of 4 oz/A after bedding but prior to transplanting. Rainfall or irrigation required. Do not apply to soils with less than 0.5% organic matter. 110-day PHI.   |
| <b>***POSTTRANSPLANT***</b>  |  |             |  |
| <b>Acifluorfen</b><br>up to 0.375  | (Ultra Blazer)<br>1.5 pt   | 14          | Broadleaves. Apply directed to the row middles with a shielded or hooded sprayer. Do not allow to contact strawberry plants. 60-day PHI.   |
| <b>Carfentrazone</b><br>up to 0.031  | (Aim) 2.0 EC<br>up to 2 fl oz  | 14          | Broadleaves. Apply with hooded applicator directed to the row middles for control of emerged broadleaves up to 4 inches tall or rosettes less than 3 inches across. Good coverage is essential. A nonionic surfactant, methylated seed oil, or crop oil concentrate is recommended. 0-day PHI. |
| <b>Clopyralid</b><br>0.125–0.25  | (Stinger) 3 EC<br>0.33–0.66 pt   | 4           | Broadleaves. Do not exceed 2/3 pt/A per year. Do not include a surfactant. 7-day PHI.  |
| <b>Clethodim</b><br>0.09–0.13<br>0.07–0.13   | (Arrow, Select) 2 EC<br>6–8 fl oz<br>(Select Max) 1 EC<br>9–16 fl oz               | 1           | Perennial and annual grasses. Use higher rates under heavy grass pressure or larger weeds. Surfactant or crop oil concentrate recommended. Consult label. 4-day PHI.   |
| <b>Fluazifop-P-butyl</b><br>0.25   | Fusilade DX<br>16 fl oz  | 1           | Supplemental label. Emerged annual and perennial grasses. Most effective on young, actively growing grasses. Do not apply more than 1 application per year. 14-day PHI.  |
| <b>Glyphosate</b>  | (various formulations)<br>consult labels   | 9           | Emerged broadleaves, grasses, and nutsedge. Apply directed to the row middles. Injury has been observed from translocation from daughter plants in the row middle to the mother plants. 14-day PHI. Spot treatment has 7-day PHI.  |
| <b>Paraquat</b><br>0.5   | (Gramoxone) 2 SL<br>2 pt<br>(Firestorm) 3 SL<br>1.3 pt                             | 22          | Emerged broadleaves and grasses. Apply as a directed spray to row middles only. Do not allow spray to contact plants. Do not apply more than 3 times per season. Nonionic surfactant recommended. 21-day PHI. <b>Consult label for new restrictions.</b>                                       |
| <b>Pelargonic acid</b>   | (Scythe) 4.2 EC<br>3%–10% v/v  | 27          | Emerged broadleaves and grasses. Apply as a preplant burndown treatment or posttransplant with shielded or hooded sprayers. Product is a contact, nonselective, foliar-applied herbicide with no residual control.   |
| <b>Sethoxydim</b><br>0.28–0.47   | (Poast) 1.5 EC<br>1.5–2.5 pt   | 1           | Emerged grasses. A maximum of 2.5 pt/A applied in one season. Unsatisfactory results may occur if applied to grasses under stress. Crop oil concentrate recommended. 7-day PHI.  |
| <b>***POSTHARVEST***</b>   |  |             |  |
| <b>Paraquat</b><br>0.49  | (Gramoxone) 2 SL<br>1.95 pt  | 22          | Broadcast spray over the top of the plants after the last harvest. Thorough coverage is required to ensure maximum herbicide burndown. Do not use treated crop for human or animal consumption. Nonionic surfactant recommended. <b>Consult label for new restrictions.</b>                    |

Table 3. Selected insecticides approved for managing insect pests of strawberry.

| Pest  | MOA Code <sup>1</sup> | Trade Name (Active Ingredient)                              | Rate (Product/Acre)                                    | Rate per Season  | REI (Hours) | Days to Harvest                     | Notes   |
|---|-----------------------|---|--|--|-------------|-------------------------------------|---|
| <b>Labels change frequently. Be sure to read a current product label before applying any chemical. Please refer to Chapter 19 for information on biopesticides, including materials labeled for certified organic production.</b> |                       |   |  |  |             |                                     |   |
| <b>Ants</b>   |                       |   |  |  |             |                                     |   |
|   | 7A                    | <b>Extinguish Professional Fire Ant Bait</b> (S-methoprene) | See label  |  | 4           | 0                                   |   |
|   | 7C                    | <b>Esteem Ant Bait</b> (pyriproxyfen)                       | 1.5–2.0 lb   |  | 12          | 1                                   |   |
| <b>Aphids</b>   |                       |   |  |  |             |                                     |   |
|   | 1B                    | <b>Diazinon 50W, AG600 WBC</b>                              | <b>50W:</b> 1 lb<br><b>AG600 WBC:</b> 12.75 fl oz      | Make a maximum of one foliar application per crop and one soil application per crop.   | 3 days      | 5                                   | Highly toxic to bees.   |
|   | 1B                    | <b>Dibrom 8-E*</b> (naled)                                  | 1 pint   | Do not apply more than 5 pints per season.   | 48          | 1                                   | Do not make more than 5 applications per season. Allow minimum of 7 days between applications.  |
|   | 1B                    | <b>Malathion 5EC, 8F</b> (malathion)                        | <b>5EC:</b> 1.5–3.2 pints<br><b>8F:</b> 1.5–2.0 pints  | <b>8F:</b> Do not apply more than 8 pints/A per year   | 12          | 3                                   | Do not make more than 4 applications per year. Minimum retreatment interval is 7 days.  |
|   | 3A + 6                | <b>Athena</b> (bifenthrin & avermectin B1)                  | 7.0–17.0 fl oz   | Do not apply more than 68 fl oz in a growing season after transplanting.   | 12          | 3                                   | Make 2 applications 7–10 days apart. If further applications are needed, wait 21 days after the second application before repeating sequence of two applications. Do not make more than 4 applications per growing season. Do not make more than 2 applications per season. Do not apply more than once every 7 days.   |
|   | 3A                    | <b>Azera</b> (azadirachtin & pyrethrins)                    | See label  | Do not apply more than 10 times per season.  | 4           | 0                                   | OMRI-listed.  |
|   | 3A                    | <b>*Brigade WSB</b> (bifenthrin)                            | 6.4–32.0 oz  | Do not apply more than 80 oz/A per season.   | 12          | 0                                   |   |
|   | 3A + 4A               | <b>*Brigadier</b> (bifenthrin & imidacloprid)               | 5.1–6.14 fl oz   | Maximum allowed is 17.92 fl oz/A per season.   | 12          | 7                                   | Do not make applications less than 5 days apart.  |
|   | 3A                    | <b>Evergreen EC 60-6</b> (pyrethrins & piperonyl butoxide)  | 2–16 fl oz   |  | 12          | 0                                   | Do not make applications less than 7 days apart. Do not make more than 10 applications in a season.   |
|   | 3A                    | <b>PyGanic EC 5.0</b> (pyrethrins)                          | See label  |  | 12          | 0                                   | OMRI-listed.  |
|   | 4A                    | <b>Actara</b> (thiamethoxam)                                | 1.5–4.0 oz   | Do not exceed a total of 12 oz/A (0.188 lb a.i./A) of Actara or 0.188 lb a.i. of thiamethoxam-containing products per acre per growing season. | 12          | 3                                   | Minimum interval between applications is 10 days. Do not use Actara in nurseries, greenhouses, plant propagation houses, or on any plants grown for use as transplants. Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in directions for use to protect pollinators. |
|   | 4A                    | <b>Admire Pro</b> (imidacloprid)                            | <b>Soil:</b> 10.5–14 fl oz<br><b>Foliar:</b> 1:3 fl oz | Do not apply more than 14.0 fl oz/A for soil and 3.9 fl oz/A for foliar applications per season.   | 12          | <b>Soil:</b> 14<br><b>Foliar:</b> 5 | Soil applications may be made as chemigation, as a plant hole treatment, or as a band spray over-the-row followed by overhead irrigation. Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in directions for use to protect pollinators.                               |

| Pest | MOA Code <sup>1</sup> | Trade Name (Active Ingredient)  | Rate (Product/Acre)                                      | Rate per Season  | REI (Hours) | Days to Harvest | Notes  |
|------|-----------------------|---|--|--|-------------|-----------------|--|
|      | 4A                    | <b>Assail 30 SG, 70 WP</b> (acetamiprid)  | <b>30 SG:</b> 1.9–6.9 oz<br><b>70 WP:</b> 0.8–3.0 oz     | <b>30 SG:</b> Do not exceed a total of 13.8 oz of Assail 30 SG/A during each growing season.<br><b>70 WP:</b> Do not exceed a total of 6.0 oz Assail 70 WP/A per growing season. | 12          | 1               | Do not make more than 2 applications per growing season. Do not apply more than once every 7 days.   |
|      | 4A                    | <b>Platinum 75 SG</b> (thiamethoxam)  | 1.7–4.01 oz  | Do not exceed 4.01 oz/A per growing season.  | 12          | 50              |  |
|      | 4A + 28               | <b>Voliain Flexi</b> (thiamethoxam & chlorantraniliprole)   | 2–5 oz   | Do not exceed 15.0 oz/A per growing season.  | 12          | 3               | Application restrictions exist for this product because of the risk to bees and other insect pollinators. Follow application restrictions found in the directions for use to protect pollinators.                    |
|      | 4D                    | <b>Sivanto Prime</b> (flupyradifurone)  | 7–10.5 fl oz   | Maximum allowed per year is 28.0 fl oz/A.  | 4           | 0               | 10-day minimum interval between applications.  |
|      | 29                    | <b>Beleaf 50 SG</b> (flonicamid)  | 2.8 oz   | Do not apply more than 8.4 oz/A Beleaf 50 SG per year.   | 12          | 0               | Do not apply more than 3 applications per year. Allow a minimum of 7 days between applications.  |
|      | -                     | <b>Aza-Direct</b> (azadirachtin)  | See label; 1–2 pints for most pests and crop conditions. |  | 4           | 0               | OMRI-listed.   |
|      | -                     | <b>Botanigard ES</b> ( <i>Beauveria bassiana</i> strain GHA)  | 0.25–1 quart   |  | 4           | 0               | Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.  |
|      | -                     | <b>Grandevo</b> (Heat-killed <i>Chromobacterium subsugae</i> strain PRAA4-1 and spent fermentation media) | 2–3 lb   |  | 4           | 0               | Can be used in organic production. OMRI-listed. Broad spectrum, repels, reduces fecundity. Tank-mix with a contact insecticide for improved control and resistance management of targeted pests.                     |
|      | -                     | <b>M-Pede</b> (potassium salts of fatty acids)  | See label.   |  | 12          | 0               | OMRI-listed.   |
|      | -                     | <b>Mycotrol ESO</b> ( <i>Beauveria bassiana</i> strain GHA)   | 0.25–1 quart   |  | 4           | 0               | OMRI-listed. Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.   |
|      | -                     | <b>Neemix 4.5% EC</b> (azadirachtin)  | 4–16 fl oz   |  | 12          | 0               | OMRI-listed.   |
|      | -                     | <b>PFR-97 20%WDG</b> ( <i>Isaria fumosoroseus</i> Apopka strain 97)                                       | 1–2 lb   |  | 4           | 0               | OMRI-listed.   |
|      | -                     | <b>SuffOil-X</b> (unsulfonated residue of petroleum oil)  | 1–2 gallons  |  | 4           | 0               | OMRI-listed.   |
|      | -                     | <b>Trilogy</b> (neem oil)   | 0.5%–2%  |  | 4           | 0               | OMRI-listed. Avoid tank mixes with captan, sulfur, or other chemically similar products.   |
|      | -                     | <b>Venerate</b> (Heat-killed <i>Burkholderia rinojensis</i> strain A396)                                  | 2–4 quarts   |  | 4           | 0               | Can be used in organic production. OMRI-listed. Broad spectrum, degrades exoskeleton, interfered with molting. Tank-mix with a contact insecticide for improved control and resistance management of targeted pests. |

| Pest                              | MOA Code <sup>1</sup> | Trade Name (Active Ingredient)  | Rate (Product/Acre)                                     | Rate per Season  | REI (Hours) | Days to Harvest | Notes   |
|-----------------------------------|-----------------------|---|---|--|-------------|-----------------|---|
| Armyworms (see also caterpillars) | 1A                    | <b>Carbaryl 4 L</b> (carbaryl)  | 1–2 quarts  | Do not apply more than a total of 10 quarts/A per crop per year.   | 12          | 7               | Bee restriction: do not apply to target crops in bloom.   |
|                                   | 1A                    | <b>Sevin 4F, 80 Solupak</b> (carbaryl)  | <b>4F:</b> 1–2 quarts<br><b>80 Solupak:</b> 1.25–2.5 lb | <b>4F:</b> Do not apply more than a total of 10 quarts/A per crop per year.<br><b>80 Solupak:</b> Do not apply more than a total of 12.5 quarts/A per crop per year.             | 12          | 7               |   |
|                                   | 3A + 6                | <b>Athena</b> (bifenthrin & avermectin B1)  | 7.0–17.0 fl oz  | Do not apply more 68 fl oz in a growing season after transplanting.  | 12          | 3               | Make 2 applications 7–10 days apart. If further applications are needed, wait 21 days after the second application before repeating sequence of two applications. Do not make more than 4 applications per growing season. Do not make more than 2 applications per season. Do not apply more than once every 7 days. |
|                                   | 3A                    | <b>Azera</b> (azadirachtin & pyrethrins)  | See label.  |  | 4           | 0               | OMRI-listed.  |
|                                   | 3A                    | <b>*Brigade WSB</b> (bifenthrin)  | 6.4–32.0 oz   | Do not apply more than 80 oz/A per season.   | 12          | 0               |   |
|                                   | 3A + 4A               | <b>*Brigadier</b> (bifenthrin & imidacloprid)   | 5.1–6.14 fl oz  | Maximum allowed is 17.92 fl oz/A per season.   | 12          | 7               | Do not make applications less than 5 days apart.  |
|                                   | 3A                    | <b>*Danitol 2.4 EC</b> (fenpropathrin)  | 10.67–21.33 fl oz                                       | Do not apply more than 42.67 fl oz/A per year.   | 24          | 2               | Do not apply more than twice a year to the same planting. May be tank-mixed with Dipel DF for armyworm control.   |
|                                   | 3A                    | <b>Evergreen EC 60-6</b> (pyrethrins & piperonyl butoxide)                              | 2–16 fl oz  |  | 12          | 0               |   |
|                                   | 3A                    | <b>PyGanic EC 5.0</b> (pyrethrins)  | See label.  |  | 12          | 0               | OMRI-listed.  |
|                                   | 4A                    | <b>Assail 30 SG, 70 WP</b> (acetamiprid)  | <b>30 SG:</b> 1.9–6.9 oz<br><b>70 WP:</b> 0.8–3.0 oz    | <b>30 SG:</b> Do not exceed a total of 13.8 oz of Assail 30 SG/A during each growing season.<br><b>70 WP:</b> Do not exceed a total of 6.0 oz Assail 70 WP/A per growing season. | 12          | 1               | Do not make more than 2 applications per growing season. Do not apply more than once every 7 days.  |
|                                   | 4A + 28               | <b>Voliam Flexi</b> (thiamethoxam & chlorantraniliprole)                                | 2–5 oz  | Do not exceed 15.0 oz/A per growing season.  | 12          | 3               | Application restrictions exist for this product because of the risk to bees and other insect pollinators. Follow application restrictions found in the directions for use to protect pollinators.   |
|                                   | 5                     | <b>Entrust SC Naturalyte Insect Control</b> (spinosad)                                  | 4.0–6.0 fl oz   | Do not apply more than 18 fl oz/A/year.  | 4           | 1               | OMRI-listed. Do not make more than 3 applications in a year.  |
|                                   | 5                     | <b>Radiant SC</b> (spinetoram)  | 6–10 fl oz  | Do not apply more than a total of 39 fl oz/A per year.   | 4           | 1               |   |
|                                   | 11A                   | <b>Agree WG</b> ( <i>Bacillus thuringiensis</i> subspecies <i>aizawai</i> strain GC-91) | 0.5–2.0 lb  |  | 4           | 0               | OMRI-listed.  |
|                                   | 11A                   | <b>Biobit HP</b> ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )           | 0.5–2.0 lb  |  | 4           | 0               | For organic production.   |
|                                   | 11A                   | <b>Deliver</b> ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )             | 0.25–1.5 lb   |  | 4           | 0               | OMRI-listed.  |

| Pest   | MOA Code <sup>1</sup>                            | Trade Name (Active Ingredient)   | Rate (Product/Acre)                                      | Rate per Season  | REI (Hours) | Days to Harvest   | Notes   |
|--|--|--|--|--|-------------|---|---|
| Beetles and weevils (including sap beetles) (see also grubs) | 11A  | <b>DipeI DF</b><br>( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )                              | 0.5–2.0 lb   |  | 4           | 0   | For armyworm and cutworm control, use the higher rate. OMRI-listed.   |
|  | 11A  | <b>Javelin WG</b><br>( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )                            | 0.25–1.5 lb  |  | 4           | 0   | OMRI-listed.  |
|  | 11A  | <b>Xentari</b><br>( <i>Bacillus thuringiensis</i> subspecies <i>aizawai</i> )                                | 0.5–2.0 lb   |  | 4           | 0   | For organic production.   |
|  | 15   | <b>Rimon 0.83EC</b><br>(novaluron)   | 9–12 fl oz   | Do not apply more than 36 oz/A per crop.   | 12          | 1   | 7-day minimum interval between applications.  |
|  | 18   | <b>Intrepid 2F</b><br>(methoxyfenozide)  | 6–12 fl oz   | Do not apply more than 64 fl oz/A per crop.  | 4           | 3   |   |
|  | 28   | <b>Coragen</b><br>(chlorantraniliprole)  | 3.5–7.5 fl oz  | Do not apply more than 15.4 fl oz/A per crop.                                      | 4           | 1   | Make no more than 4 applications/A per crop. Minimum interval between treatments is 7 days.   |
|  | -  | <b>Aza-Direct</b><br>(azadirachtin)  | See label; 1–2 pints for most pests and crop conditions. |  | 4           | 0   |   |
|  | -  | <b>Grandevo</b><br>(Heat-killed <i>Chromobacterium subsugae</i> strain PRAA4-1 and spent fermentation media) | 1–3 lb   |  | 4           | 0   | Can be used in organic production. OMRI-listed. Broad spectrum, repels, reduces fecundity. Tank-mix with a contact insecticide for improved control and resistance management of targeted pests.  |
|  | -  | <b>Neemix 4.5% EC</b><br>(azadirachtin)  | 4–16 fl oz   |  | 12          | 0   |   |
|  | -  | <b>Venerate</b><br>(Heat-killed <i>Burkholderia rinojensis</i> strain A396)                                  | 1–4 quarts   |  | 4           | 0   | Can be used in organic production. OMRI-listed. Broad spectrum, degrades exoskeleton, interfered with molting. Tank-mix with a contact insecticide for improved control and resistance management of targeted pests.  |
|  | 1B   | <b>*Govern 4E</b><br>(chlorpyrifos)  | See label.   | Do not apply more than 2 quarts preplant/A per year or 2 quarts foliar/A per year. | 24          | 21  | Do not make more than 1 preplant or 2 foliar applications per year. Do not apply after berries form or when berries are present.  |
|  | 1B   | <b>Lorsban 75WG</b><br>(chlorpyrifos)  | 1.33–2.67 lb   | Do not apply more than 2.67 lb/A per year.   | 24          | 21  | Do not make more than 1 preplant or 2 foliar applications per year.   |
|  | 3A + 6   | <b>Athene</b><br>(bifenthrin & avermectin B1)  | 7.0–17.0 fl oz   | Do not apply more than 68 fl oz in a growing season after transplanting.           | 12          | 3   | Make 2 applications 7–10 days apart. If further applications are needed, wait 21 days after the second application before repeating sequence of two applications. Do not make more than 4 applications per growing season. Do not make more than 2 applications per season. Do not apply more than once every 7 days. |
|  | 3A   | <b>Azera Insecticide</b><br>(azadirachtin & pyrethrins)  | 32.0–56.0 fl oz  | Do not apply more than 58.2 fl oz in a season.                                     | 4           | 0   | OMRI-listed.  |
|  | 3A   | <b>*Brigade WSB</b><br>(bifenthrin)  | 6.4–32.0 oz  | Do not apply more than 80 oz/A per season.   | 12          | 0   |   |
| 3A + 4A  | <b>*Brigadier</b><br>(bifenthrin & imidacloprid) | 5.1–6.14 fl oz   | Maximum allowed is 17.92 fl oz/A per season.             | 12   | 7           | Do not make applications less than 5 days apart.  |   |
| 3A   | <b>*Danitol 2.4 EC</b><br>(fenpropathrin)        | 10.67–21.33 fl oz  | Do not apply more than 42.67 fl oz/A per year.           | 24   | 2           | Do not apply more than twice a year to the same planting. May be tank-mixed with Dipel DF for armyworm control. |   |

| Pest   | MOA Code <sup>1</sup>   | Trade Name (Active Ingredient)                              | Rate (Product/Acre)  | Rate per Season  | REI (Hours) | Days to Harvest                     | Notes   |
|--|---|---|--|--|-------------|-------------------------------------|---|
| Caterpillars (including budworms, earworms, leafrollers, leaf tiers, borers, and loopers) (see also armyworms) | 4A  | <b>Admire Pro</b> (imidacloprid)                            | <b>Soil:</b> 10.5–14 fl oz<br><b>Foliar:</b> 1.3 fl oz                 | Do not apply more than 14.0 fl oz/A for soil and 3.9 fl oz/A for foliar applications per season.   | 12          | <b>Soil:</b> 14<br><b>Foliar:</b> 5 | Soil applications may be made as chemigation, as a plant-hole treatment, or as a band spray over-the-row followed by overhead irrigation. Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in directions for use to protect pollinators. |
|  | 4A  | <b>Assail 30 SG, 70 WP</b> (acetamiprid)                    | <b>30 SG:</b> 1.9–6.9 oz<br><b>70 WP:</b> 0.8–3.0 oz                   | <b>30 SG:</b> Do not exceed a total of 13.8 oz of Assail 30 SG/A during each growing season.<br><b>70 WP:</b> Do not exceed a total of 6.0 oz Assail 70 WP/A per growing season. | 12          | 1                                   | Do not make more than 2 applications per growing season. Do not apply more than once every 7 days.  |
|  | 15  | <b>Rimon 0.83EC</b> (novaluron)                             | 9–12 fl oz   | Do not apply more than 36 oz/A per season.   | 12          | 1                                   | 7-day minimum interval between applications.  |
|  | -   | <b>MET52 EC</b> ( <i>Metarhizium anisopliae</i> strain F52) | <b>Drench:</b> 40–80 fl oz/100 gal<br><b>Foliar:</b> 0.5 pint–2 quarts |  | 4           | 0                                   |   |
|  | -   | <b>Mycotrol ESO</b> ( <i>Beauveria bassiana</i> strain GHA) | 0.25–1 quart   |  | 4           | 0                                   | OMRI-listed. Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.  |
|  | 1A  | <b>Carbaryl 4 L</b> (carbaryl)                              | 1–2 quarts   | Do not apply more than a total of 10 quarts/A per crop per year.   | 12          | 7                                   | Bee restriction: do not apply to target crops in bloom.   |
|  | 1A  | <b>Sevin 4F, 80 Solupak</b> (carbaryl)                      | <b>4F:</b> 1–2 quarts<br><b>80 Solupak:</b> 1.25–2.5 lb                |  | 12          | 7                                   |   |
|  | 1B  | <b>Diazinon 50W, AG600 WBC</b>                              | <b>50W:</b> 1–2 lb<br><b>AG600 WBC:</b> 12.75–25.5 fl oz               | Make a maximum of one foliar application per crop and one soil application per crop.   | 3 days      | 5                                   |   |
|  | 1B  | <b>Dibrom 8-E*</b> (naled)                                  | 1 pint   | Do not apply more than 5 pints per season.   | 48          | 1                                   |   |
|  | 1B  | <b>Malathion 5EC, 8F</b> (malathion)                        | <b>5EC:</b> 1.5–3.2 pints<br><b>8F:</b> 1.5–2.0 pints                  | <b>8F:</b> Do not apply more than 8 pints/A per year.  | 12          | 3                                   | Do not make more than 4 applications per year. Minimum retreatment interval is 7 days.  |
|  | 3A  | <b>Azera</b> (azadirachtin & pyrethrins)                    | See label.   |  | 4           | 0                                   |   |
|  | 4A  | <b>Assail 30 SG, 70 WP</b> (acetamiprid)                    | <b>30 SG:</b> 1.9–6.9 oz<br><b>70 WP:</b> 0.8–3.0 oz                   | <b>30 SG:</b> Do not exceed a total of 13.8 oz of Assail 30 SG/A during each growing season.<br><b>70 WP:</b> Do not exceed a total of 6.0 oz Assail 70 WP/A per growing season. | 12          | 1                                   | Do not make more than 2 applications per growing season. Do not apply more than once every 7 days.  |
|  | 5   | <b>Entrust SC Naturalyte Insect Control</b> (spinosad)      | 4.0–6.0 fl oz  | Do not apply more than 18 fl oz/A/year.  | 4           | 1                                   | OMRI-listed. Do not make more than 3 applications per year.   |
|  | 5   | <b>Radiant SC</b> (spinetoram)                              | 6–10 fl oz   | Do not apply more than a total of 39 fl oz/A per year.   | 4           | 1                                   |   |
| 11A  | <b>Biobit HP</b> ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> ) | 0.5–2.0 lb  |  | 4  | 0           |                                     |   |

| Pest                     | MOA Code <sup>1</sup>   | Trade Name (Active Ingredient)  | Rate (Product/Acre)                                      | Rate per Season  | REI (Hours) | Days to Harvest  | Notes  |
|--------------------------|---|---|--|--|-------------|--|--|
| Crickets and cockroaches | 11A   | <b>Deliver</b><br>( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )                          | 0.25–1.5 lb  |  | 4           | 0  |  |
|                          | 11A   | <b>DiPel DF</b><br>( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )                         | 0.5–2.0 lb   |  | 4           | 0  | For armyworm and cutworm control, use the higher rate.   |
|                          | 11A   | <b>Javelin WG</b><br>( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )                       | 0.25–1.5 lb  |  | 4           | 0  |  |
|                          | 11A   | <b>Xentari</b><br>( <i>Bacillus thuringiensis</i> subspecies <i>aizawa</i> )                            | 0.5–2.0 lb   |  | 4           | 0  |  |
|                          | -   | <b>Botanigard ES</b><br>( <i>Beauveria bassiana</i> strain GHA)   | 0.25–1 quart   |  | 4           | 0  | Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.  |
|                          | -   | <b>Grandevo</b><br>(Heat-killed <i>Chromobacterium subtsugae</i> strain PRAA4-1 and spent fermentation) | 1–3 lb   |  | 4           | 0  | Can be used in organic production. OMRI-listed. Broad spectrum, repels, reduces fecundity. Tank-mix with a contact insecticide for improved control and resistance management of targeted pests.                     |
|                          | -   | <b>Mycotrol ESO</b><br>( <i>Beauveria bassiana</i> strain GHA)  | 0.25–1 quart   |  | 4           | 0  | OMRI-listed. Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.   |
|                          | -   | <b>Neemix 4.5% EC</b><br>(azadirachtin)   | 4–16 fl oz   |  | 12          | 0  |  |
|                          | -   | <b>PFR-97 20%WDG</b><br>( <i>Isaria fumosoroseus</i> Apopka strain 97)                                  | 1–2 lb   |  | 4           | 0  |  |
|                          | -   | <b>Venerate</b><br>(Heat-killed <i>Burkholderia rinojensis</i> strain A396)                             | 1–4 quarts   |  | 4           | 0  | Can be used in organic production. OMRI-listed. Broad spectrum, degrades exoskeleton, interferes with molting. Tank-mix with a contact insecticide for improved control and resistance management of targeted pests. |
|                          | 1A  | <b>Carbaryl 4 L</b><br>(carbaryl)   | 1–2 quarts   | Do not apply more than a total of 10 quarts/A per crop per year.                     | 12          | 7  | Bee restriction: do not apply to target crops in bloom.  |
|                          | 1B  | <b>Diazinon 50W, AG600 WBC</b>  | <b>50W:</b> 1–2 lb<br><b>AG600 WBC:</b> 12.75–25.5 fl oz | Make a maximum of one foliar application per crop and one soil application per crop. | 3 days      | 5  |  |
|                          | 1B  | <b>Malathion 5EC, 8F</b><br>(malathion)   | <b>5EC:</b> 1.5–3.2 pints<br><b>8F:</b> 1.5–2.0 pints    | <b>8F:</b> Do not apply more than 8 pints/A per year.                                | 12          | 3  | Do not make more than 4 applications per year. Minimum retreatment interval is 7 days.   |
|                          | 15  | <b>Rimon 0.83EC</b><br>(novaluron)  | 9–12 fl oz   | Do not apply more than 36 oz/A per season.   | 12          | 1  | 7-day minimum interval between applications.   |
| -                        | <b>Botanigard ES</b><br>( <i>Beauveria bassiana</i> strain GHA) | 0.25–1 quart  |  | 4  | 0           | Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.              |  |
| -                        | <b>Aza-Direct</b><br>(azadirachtin)                             | See label; 1–2 pints for most pests and crop conditions.  |  | 4  | 0           | OMRI-listed.   |  |
| -                        | <b>Mycotrol ESO</b><br>( <i>Beauveria bassiana</i> strain GHA)  | 0.25–1 quart  |  | 4  | 0           | OMRI-listed. Apply in sufficient water to cover foliage, typically 5–100 gallons per acre. |  |

| Pest  | MOA Code <sup>1</sup>   | Trade Name (Active Ingredient)   | Rate (Product/Acre)                                      | Rate per Season  | REI (Hours) | Days to Harvest  | Notes   |
|---|---|--|--|--|-------------|--|---|
| Fruit fly (vinegar fly) and spotted wing drosophila | 3A  | *Brigade WSB (bifenthrin)  | 6.4–32.0 oz  | Do not apply more than 80 oz/A per season.   | 12          | 0  |   |
|   | 3A  | *Danitol 2.4 EC (fenpropathrin)  | 10.67–21.33 fl oz  | Do not apply more than 42.67 fl oz/A per year.   | 24          | 2  | Do not apply more than twice a year to the same planting.   |
|   | 3A  | Evergreen EC 60-6 (pyrethrins & piperonyl butoxide)  | 2–16 fl oz   |  | 12          | 0  |   |
|   | 3A  | PyGanic EC 5.0 (pyrethrins)  | See label.   |  | 12          | 0  | OMRI-listed.  |
|   | 4A  | Actara (thiamethoxam)  | 1.5–4.0 oz   | Do not exceed a total of 12 oz/A (0.188 lb a.i./A) of Actara or 0.188 lb a.i. of thiamethoxam-containing products per acre per growing season.                     | 12          | 3  | Minimum interval between applications is 10 days. Do not use Actara in nurseries, greenhouses, plant propagation houses, or on any plants grown for use as transplants. Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in directions for use to protect pollinators. |
|   | 4A  | Admire Pro (imidacloprid)  | Soil: 10.5–14 fl oz<br>Foliar: 1.3 fl oz                 | Do not apply more than 14.0 fl oz/A for soil and 3.9 fl oz/A for foliar applications per season.   | 12          | Soil: 14<br>Foliar: 5  | Soil applications may be made as chemigation, as a plant-hole treatment or as a band spray over-the-row followed by overhead irrigation. Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in directions for use to protect pollinators.                                |
|   | 4A  | Assail 30 SG, 70 WP (acetamiprid)  | 30 SG: 1.9–6.9 oz<br>70 WP: 0.8–3.0 oz                   | 30 SG: Do not exceed a total of 13.8 oz of Assail 30 SG/A during each growing season.<br>70 WP: Do not exceed a total of 6.0 oz Assail 70 WP/A per growing season. | 12          | 1  | Do not make more than 2 applications per growing season. Do not apply more than once every 7 days.  |
|   | 28  | Exirel (cyantraniliprole)  | 13.5–20.5 fl oz  |  | 12          | 1  | For control of spotted wing drosophila.   |
|   | -   | Aza-Direct (azadirachtin)  | See label: 1–2 pints for most pests and crop conditions. |  | 4           | 0  | OMRI-listed.  |
|   | -   | Grandevo (Heat-killed <i>Chromobacterium subsugae</i> strain PRAA4-1 and spent fermentation media) | 2–3 lb   |  | 4           | 0  | Can be used in organic production. OMRI-listed. Broad spectrum, repels, reduces fecundity. Tank-mix with a contact insecticide for improved control and resistance management of targeted pests.  |
| -   | Venerate (Heat-killed <i>Burkholderia rinojensis</i> strain A396) | 2–4 quarts   |  | 4  | 0           | Can be used in organic production. OMRI-listed. Broad spectrum, degrades exoskeleton, interfered with molting. Tank-mix with a contact insecticide for improved control and resistance management of targeted pests. |   |
| Grubs (see also beetles)                            | 1B  | *Govern 4E (chlorpyrifos)  | See label.   | Do not apply more than 2 quarts preplant/A per year or 2 quarts foliar/A per year.   | 24          | 21   | Do not make more than 1 preplant or 2 foliar applications per year. Do not apply after berries form or when berries are present.  |
|   | 1B  | Lorsban 75WG (chlorpyrifos)  | 1.33–2.67 lb   | Do not apply more than 2.67 lb/A per year.   | 24          | 21   | Do not make more than 1 preplant or 2 foliar applications per year.   |
|   | 3A + 6  | Athena (bifenthrin & avermectin B1)  | 8.5–17.0 fl oz at plant                                  | Do not apply more than 68 fl oz in a growing season after transplanting.   | 12          | 3  |   |

| Pest  | MOA Code <sup>1</sup>                      | Trade Name (Active Ingredient)                                  | Rate (Product/Acre)                                      | Rate per Season   | REI (Hours) | Days to Harvest   | Notes  |
|---|--|---|--|---|-------------|---|--|
| Mites (including two-spotted spider mite, strawberry spider mite, carmine spider mite, cyclamen mite, broad mite) | 4A   | <b>Admire Pro</b><br>(imidacloprid)                             | <b>Soil:</b> 10.5–14 fl oz<br><b>Foliar:</b> 1.3 fl oz   | Do not apply more than 14.0 fl oz/A for soil and 3.9 fl oz/A for foliar applications per season.  | 12          | <b>Soil:</b> 14<br><b>Foliar:</b> 5   | Soil applications may be made as chemigation, as a plant-hole treatment or as a band spray over-the-row followed by overhead irrigation. Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in directions for use to protect pollinators. |
|   | 4A   | <b>Platinum 75 SG</b><br>(thiamethoxam)                         | 1.7–4.01 oz  | Do not exceed 4.01 oz/A per growing season.   | 12          | 50  | Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.  |
|   | -  | <b>Botanigard ES</b><br>( <i>Beauveria bassiana</i> strain GHA) | 0.25–1 quart   |   | 4           | 0   | OMRI-listed. Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.   |
|   | -  | <b>Mycotrol ESO</b><br>( <i>Beauveria bassiana</i> strain GHA)  | 0.25–1 quart   |   | 4           | 0   | OMRI-listed. Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.   |
|   | 1B   | <b>Diazinon 50W, AG600 WBC</b>                                  | <b>50W:</b> 1–2 lb<br><b>AG600 WBC:</b> 12.75–25.5 fl oz | Make a maximum of one foliar application per crop and one soil application per crop.  | 3 days      | 5   |  |
|   | 1B   | <b>Dibrom 8-E*</b><br>(Naled)                                   | 1 pint   | Do not apply more than 5 pints per season.  | 48          | 1   | Do not make more than 4 applications per year. Minimum retreatment interval is 7 days.   |
|   | 1B   | <b>Malathion 5EC, 8F</b><br>(malathion)                         | <b>5EC:</b> 1.5–3.2 pints<br><b>8F:</b> 1.5–2.0 pints    | <b>8F:</b> Do not apply more than 8 pints/A per year.   | 12          | 3   | Make 2 applications 7–10 days apart. If further applications are needed, wait 21 days after the second application before repeating sequence of two applications. Do not make more than 4 applications per growing season. Do not make more than 2 applications per season. Do not apply more than once every 7 days.              |
|   | 3A + 6                                     | <b>Athena</b><br>(bifenthrin & avermectin B1)                   | 7.0–17.0 fl oz   | Do not apply more than 68 fl oz in a growing season after transplanting.  | 12          | 3   |  |
|   | 3A   | <b>*Brigade WSB</b><br>(bifenthrin)                             | 6.4–32.0 oz  | Do not apply more than 80 oz/A per season.  | 12          | 0   | Do not apply more than twice a year to the same planting. May be tank-mixed with Dipel DF for armyworm control.  |
|   | 3A   | <b>*Danitol 2.4 EC</b><br>(fenprothrin)                         | 10.67–21.33 fl oz  | Do not apply more than 42.67 fl oz/A per year.  | 24          | 2   |  |
|   | 6  | <b>Agri-Mek 0.15 EC*, SC*</b><br>(abamectin)                    | <b>0.15 EC:</b> 16 oz<br><b>SC:</b> 3.5 fl oz            | <b>0.15 EC:</b> Do not apply more than 64 fl oz/A (0.075 lb a.i./A) of Agri-Mek SC or any other foliar-applied abamectin-containing product in a growing season.<br><b>SC:</b> Do not apply more than 14 fl oz/A (0.075 lb a.i./A) of Agri-Mek SC or any other foliar-applied abamectin-containing product in a growing season. | 12          | 3   | Wait at least 21 days after second application before repeating application. Agri-Mek SC must be mixed with a surfactant approved for use on strawberries. Make 2 applications 7–10 days apart when mites first appear.  |
|   | 10A  | <b>Savey 50 DF</b><br>(hexythiazox)                             | 6 oz   | Do not apply more than 6 oz/A per year.   | 12          | 3   | Do not make more than 1 application per season.  |
| 10B   | <b>Zeal</b><br>(etoxazole)                 | 2–3 oz  | Do not apply more than 3.0 oz/A per season.              | 12  | 1           | Make no more than 4 applications per season.  |  |
| 12B   | <b>*Vendex 50 WP</b><br>(fenbutatin oxide) | 1.5–2.0 lb  | Apply no more than 4 lb/A per season.                    | 48  | 1           | Allow a minimum of 21 days between treatments. Do not make more than 2 applications per year. |  |
| 20B   | <b>Kanemite 15 SC</b><br>(acequinocyl)     | 21–31 fl oz   | Do not apply more than 62 fl oz/A per season.            | 12  | 1           | Allow 14 days between applications.   |  |

| Pest | MOA Code <sup>1</sup> | Trade Name (Active Ingredient)   | Rate (Product/Acre)  | Rate per Season   | REI (Hours) | Days to Harvest | Notes  |
|------|-----------------------|--|--|---|-------------|-----------------|--|
|      | 20D                   | <b>Acramite 50WS</b><br>(bifenazate)   | 0.75–1.0 lb  | Two applications allowed per season; 21 days minimum between applications.                      | 12          | 1               | Acramite is not systemic in action; therefore, complete coverage of both upper and lower leaf surfaces and of fruit is necessary for effective control.  |
|      | 21A                   | <b>Nexter</b><br>(pyridaben)   | 7.5–17 oz  | Do not make more than two applications per year. Allow 30 days between sequential applications. | 12          | 10              |  |
|      | 21A                   | <b>Portal XLO</b><br>(fenpyroximate)   | 2 pints  | Do not apply more than 4.0 pints/A per crop cycle.  | 12          | 1               | Do not make more than 2 applications per crop season. Allow a minimum of 14 days between applications.   |
|      | 23                    | <b>Oberon 25C</b><br>(spiromesifen)  | 12–16 fl oz  | Do not apply more than 48 fl oz/A per crop season.  | 12          | 3               | Active against eggs, nymphs, and adults. Thorough coverage is necessary.   |
|      | 25                    | <b>Nealta</b><br>(cyflumetofen)  | 13.7 fl oz   | Do not apply more than 27.4 fl oz/A per season per crop.  | 12          | 1               | Active against eggs, nymphs and adults. Thorough coverage is necessary. Do not make more than 2 applications per year. Allow a minimum of 14 days between applications.  |
|      | -                     | <b>Aza-Direct</b><br>(azadirachtin)  | See label; 1–2 pints for most pests and crop conditions                |   | 4           | 0               | OMRI-listed.   |
|      | -                     | <b>Grandevo</b><br>(Heat-killed <i>Chromobacterium subsugae</i> strain PRAA4-1 and spent fermentation media) | 2–3 lb   |   | 4           | 0               | Can be used in organic production. OMRI-listed. Broad spectrum, repels, reduces fecundity. Tank-mix with a contact insecticide for improved control and resistance management of targeted pests.                     |
|      | -                     | <b>JMS Stylet Oil</b><br>(paraffinic oil)  | 3 quarts/100 gal water   |   | 4           | 0               | OMRI-listed.   |
|      | -                     | <b>METS2 EC</b><br>( <i>Metarhizium anisopliae</i> strain F52)   | <b>Drench:</b> 40–80 fl oz/100 gal<br><b>Foliar:</b> 0.5 pint–2 quarts |   | 4           | 0               |  |
|      | -                     | <b>M-Pede</b><br>(potassium salts of fatty acids)  | See label.   |   | 12          | 0               | OMRI-listed.   |
|      | -                     | <b>PFR-97 20%WDG</b><br>( <i>Isaria fumosoroseus</i> Apopka strain 97)                                       |  | 1–2 lb  | 4           | 0               | OMRI-listed.   |
|      | -                     | <b>SuffOil-X</b><br>(unsulfonated residue of petroleum oil)  | 1–2 gallons  |   | 4           | 0               | OMRI-listed.   |
|      | -                     | <b>Trilogy</b><br>(neem oil)   | 0.5%–2%  |   | 4           | 0               | OMRI-listed. Avoid tank mixes with captan, sulfur, or other chemically similar products.   |
|      | -                     | <b>Venerate</b><br>(Heat-killed <i>Burkholderia rinojensis</i> strain A396)                                  | 2–3 lb   |   | 4           | 0               | Can be used in organic production. OMRI-listed. Broad spectrum, degrades exoskeleton, interfered with molting. Tank-mix with a contact insecticide for improved control and resistance management of targeted pests. |

| Pest                               | MOA Code <sup>1</sup> | Trade Name (Active Ingredient)  | Rate (Product/Acre)                                     | Rate per Season  | REI (Hours) | Days to Harvest | Notes   |
|------------------------------------|-----------------------|---|---|--|-------------|-----------------|---|
| Plant bugs, including <i>Lygus</i> | 1A                    | <b>Carbaryl 4 L</b> (carbaryl)  | 1–2 quarts  | Do not apply more than a total of 10 quarts/A per crop per year.   | 12          | 7               |   |
|                                    | 1A                    | <b>Sevin 4F, 80 Solupak</b> (carbaryl)  | <b>4F:</b> 1–2 quarts<br><b>80 Solupak:</b> 1.25–2.5 lb | <b>4F:</b> Do not apply more than a total of 10 quarts/A per crop per year.<br><b>80 Solupak:</b> Do not apply more than a total of 12.5 quarts/A per crop per year.             | 12          | 7               | Do not make more than 4 applications per year. Minimum retreatment interval is 7 days.  |
|                                    | 1B                    | <b>Malathion 5EC, 8F</b> (malathion)  | <b>5EC:</b> 1.5–3.2 pints<br><b>8F:</b> 1.5–2.0 pints   | <b>8F:</b> Do not apply more than 8 pints/A per year.  | 12          | 3               | Make 2 applications 7–10 days apart. If further applications are needed, wait 21 days after the second application before repeating sequence of two applications. Do not make more than 4 applications per growing season. Do not make more than 2 applications per season. Do not apply more than once every 7 days. |
|                                    | 3A + 6                | <b>Athena</b> (bifenthrin & avermectin B1)  | 7.0–17.0 fl oz  | Do not apply more than 68 fl oz in a growing season after transplanting.   | 12          | 3               |   |
|                                    | 3A                    | <b>*Brigade WSB</b> (bifenthrin)  | 6.4–32.0 oz   | Do not apply more than 80 oz/A per season.   | 12          | 0               | Do not make applications less than 5 days apart.  |
|                                    | 3A + 4A               | <b>*Briga dier</b> (bifenthrin & imidacloprid)  | 5.1–6.14 fl oz  | Maximum allowed is 17.92 fl oz/A per season.   | 12          | 7               | Do not apply more than twice a year to the same planting. May be tank-mixed with Dipel DF for armyworm control.   |
|                                    | 3A                    | <b>*Danitol 2.4 EC</b> (fenpropathrin)  | 10.67–21.33 fl oz                                       | Do not apply more than 42.67 fl oz/A per year.   | 24          | 2               |   |
|                                    | 3A                    | <b>Evergreen EC 60-6</b> (pyrethrins & piperonyl butoxide)  | 2–16 fl oz  |  | 12          | 0               | Allow a minimum of 7 days between applications. Do not make more than 10 applications per season.   |
|                                    | 3A                    | <b>PyGanic EC 5.0</b> (pyrethrins)  | See label   |  | 12          | 0               | OMRI-listed. Do not make more than 2 applications per growing season. Do not apply more than once every 7 days.   |
|                                    | 4A                    | <b>Assail 30 SG, 70 WP</b> (acetamiprid)  | <b>30 SG:</b> 1.9–6.9 oz<br><b>70 WP:</b> 0.8–3.0 oz    | <b>30 SG:</b> Do not exceed a total of 13.8 oz of Assail 30 SG/A during each growing season.<br><b>70 WP:</b> Do not exceed a total of 6.0 oz Assail 70 WP/A per growing season. | 12          | 1               | 7-day minimum interval between applications.  |
|                                    | 15                    | <b>Rimon 0.83EC</b> (novaluron)   | 9–12 fl oz  | Do not apply more than 36 oz/A per season.   | 12          | 1               | Do not apply more than 3 applications per year. Allow a minimum of 7 days between applications.   |
|                                    | 29                    | <b>Beleaf 50 SG</b> (flonicamid)  | 2.8 oz  | Do not apply more than 8.4 oz/A Beleaf 50 SG per year.   | 12          | 0               | Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.   |
|                                    | -                     | <b>Botanigard ES</b> ( <i>Beauveria bassiana</i> strain GHA)  | 0.25–1 quart  |  | 4           | 0               | OMRI-listed. Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.  |
|                                    | -                     | <b>Mycotrol ESO</b> ( <i>Beauveria bassiana</i> strain GHA)   | 0.25–1 quart  |  | 4           | 0               |   |
|                                    | -                     | <b>Grandevo</b> (Heat-killed <i>Chromobacterium subsugae</i> strain PRAA4-1 and spent fermentation media) | 2–3 lb  |  | 4           | 0               | Can be used in organic production. OMRI-listed. Broad spectrum, repels, reduces fecundity. Tank-mix with a contact insecticide for improved control and resistance management of targeted pests.  |

| Pest  | MOA Code <sup>1</sup> | Trade Name (Active Ingredient)   | Rate (Product/Acre)  | Rate per Season  | REI (Hours) | Days to Harvest | Notes  |
|---|-----------------------|--|--|--|-------------|-----------------|--|
|   | -                     | <b>Venerate</b><br>(Heat-killed <i>Burkholderia rinojensis</i> strain A396)                                  | 2–4 quarts   |  | 4           | 0               | Can be used in organic production. OMRI-listed. Broad spectrum, degrades exoskeleton, interfered with molting. Tank-mix with a contact insecticide for improved control and resistance management of targeted pests. |
|   | -                     | <b>PFR-97 20%WDG</b><br>( <i>Sarria fumosoroseus</i> Apopka strain 97)                                       | 1–2 lb   |  | 4           | 0               | Bee restriction: do not apply to target crops in bloom.  |
| <b>Thrips</b><br>(including flower thrips, chilli thrips) | 1B                    | <b>Dibrom 8-E*</b><br>(Naled)  | 1 pint   | Do not apply more than 5 pints per season.   | 48          | 1               | Do not make more than 4 applications per year. Minimum retreatment interval is 7 days.   |
|   | 1B                    | <b>Malathion 5EC, 8F</b><br>(malathion)  | <b>5EC:</b> 1.5–3.2 pints<br><b>8F:</b> 1.5–2.0 pints                  | <b>8F:</b> Do not apply more than 8 pints/A per year.  | 12          | 3               |  |
|   | 3A                    | <b>Azera</b><br>(azadirachtin & pyrethrins)  | See label.   |  | 4           | 0               |  |
|   | 3A                    | <b>Evergreen EC 60-6</b><br>(pyrethrins & piperonyl butoxide)  | 2–16 fl oz   |  | 12          | 0               |  |
|   | 3A                    | <b>PyGanic EC 5.0</b><br>(pyrethrins)  | See label.   |  | 12          | 0               | Do not make more than 2 applications per growing season. Do not apply more than once every 7 days. OMRI-listed.  |
|   | 4A                    | <b>Assail 30 SG, 70 WP</b><br>(acetamiprid)  | <b>30 SG:</b> 1.9–6.9 oz<br><b>70 WP:</b> 0.8–3.0 oz                   | <b>30 SG:</b> Do not exceed a total of 13.8 oz of Assail 30 SG/A during each growing season.<br><b>70 WP:</b> Do not exceed a total of 6.0 oz Assail 70 WP/A per growing season. | 12          | 1               | OMRI-listed. Do not make applications less than 5 days apart except for thrips.  |
|   | 5                     | <b>Entrust SC Naturalyte Insect Control</b><br>(spinosad)  | 4.0–6.0 fl oz  | Do not apply more than 18 fl oz/A/year.  | 4           | 1               | OMRI-listed. Do not make more than 3 applications a year.  |
|   | 5                     | <b>Radiant SC</b><br>(spinetoram)  | 6–10 fl oz   | Do not apply more than a total of 39 fl oz/A per year.   | 4           | 1               | Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.  |
|   | 28                    | <b>Exirel</b><br>(cyantraniliprole)  | 13.5–20.5 fl oz  |  | 12          | 1               | The label for this product contains warnings for the protection of pollinators.  |
|   | -                     | <b>BotaniGard ES</b><br>( <i>Beauveria bassiana</i> strain GHA)  | 0.25–1 quart   |  | 4           | 0               | OMRI-listed.   |
|   | -                     | <b>Aza-Direct</b><br>(azadirachtin)  | See label; 1–2 pints for most pests and crop conditions.               |  | 4           | 0               |  |
|   | -                     | <b>Grandevo</b><br>(Heat-killed <i>Chromobacterium subsugae</i> strain PRAA4-1 and spent fermentation media) | 2–3 lb   |  | 4           | 0               | Can be used in organic production. OMRI-listed. Broad spectrum, repels, reduces fecundity. Tank-mix with a contact insecticide for improved control and resistance management of targeted pests.                     |
|   | -                     | <b>MET52 EC</b><br>( <i>Metarhizium anisopliae</i> strain F52)   | <b>Drench:</b> 40–80 fl oz/100 gal<br><b>Foliar:</b> 0.5 pint–2 quarts |  | 4           | 0               | OMRI-listed. Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.   |
|   | -                     | <b>Mycotrol ESO</b><br>( <i>Beauveria bassiana</i> strain GHA)   | 0.25–1 quart   |  | 4           | 0               |  |

| Pest              | MOA Code <sup>1</sup> | Trade Name (Active Ingredient)   | Rate (Product/Acre)                                    | Rate per Season  | REI (Hours) | Days to Harvest                     | Notes  |
|-------------------|-----------------------|--|--|--|-------------|-------------------------------------|--|
|                   | -                     | <b>Neemix 4.5% EC</b> (azadirachtin)                                     | 4–16 fl oz   |  | 12          | 0                                   | OMRI-listed.   |
|                   | -                     | <b>PFR-97 20%WDG</b> ( <i>Isaria fumosoroseus</i> Apopka strain 97)      | 1–2 lb   |  | 4           | 0                                   | OMRI-listed.   |
|                   | -                     | <b>Venerate</b> (Heat-killed <i>Burkholderia rinojensis</i> strain A396) | 2–4 quarts   |  | 4           | 0                                   | Can be used in organic production. OMRI-listed. Broad spectrum, degrades exoskeleton, interfered with molting. Tank-mix with a contact insecticide for improved control and resistance management of targeted pests.   |
| <b>Whiteflies</b> | 1B                    | <b>Malathion 5EC, 8F</b> (malathion)                                     | <b>5EC:</b> 1.5–3.2 pints<br><b>8F:</b> 1.5–2.0 pints  | <b>8F:</b> Do not apply more than 8 pints/A per year.  | 12          | 3                                   | Make 2 applications 7–10 days apart. If further applications are needed wait 21 days after the second application before repeating sequence of two applications. Do not make more than 4 applications per growing season. Do not make more than 2 applications per season. Do not apply more than once every 7 days. |
|                   | 3A + 6                | <b>Athena</b> (bifenthrin & avermectin B1)                               | 7.0–17.0 fl oz   | Do not apply more than 68 fl oz in a growing season after transplanting.   | 12          | 3                                   |  |
|                   | 3A                    | <b>Azera</b> (azadirachtin & pyrethrins)                                 | See label.   |  | 4           | 0                                   | Do not make applications less than 5 days apart.   |
|                   | 3A + 4A               | <b>*Brigadier</b> (bifenthrin & imidacloprid)                            | 5.1–6.14 fl oz   | Maximum allowed is 17.92 fl oz/A per season.   | 12          | 7                                   |  |
|                   | 3A                    | <b>Evergreen EC 60-6</b> (pyrethrins & piperonyl butoxide)               | 2–16 fl oz   |  | 12          | 0                                   |  |
|                   | 3A                    | <b>PyGanic EC 5.0</b> (pyrethrins)                                       | See label.   | Do not apply more than 10 times per season.  | 12          | 0                                   | OMRI-listed.   |
|                   | 4A                    | <b>Actara</b> (thiamethoxam)   | 3.0–4.0 oz   | Do not exceed a total of 12 oz/A (0.188 lb a.i./A) of Actara or 0.188 lb a.i. of thiamethoxam-containing products per acre per growing season.                                   | 12          | 3                                   | Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in directions for use to protect pollinators.  |
|                   | 4A                    | <b>Admire Pro</b> (imidacloprid)   | <b>Soil:</b> 10.5–14 fl oz<br><b>Foliar:</b> 1.3 fl oz | Do not apply more than 14.0 fl oz/A for soil and 3.9 fl oz/A for foliar applications per season.   | 12          | <b>Soil:</b> 14<br><b>Foliar:</b> 5 | Do not make more than 2 applications per growing season. Do not apply more than once every 7 days.   |
|                   | 4A                    | <b>Assail 30 SG, 70 WP</b> (acetamiprid)                                 | <b>30 SG:</b> 1.9–6.9 oz<br><b>70 WP:</b> 0.8–3.0 oz   | <b>30 SG:</b> Do not exceed a total of 13.8 oz of Assail 30 SG/A during each growing season.<br><b>70 WP:</b> Do not exceed a total of 6.0 oz Assail 70 WP/A per growing season. | 12          | 1                                   |  |
|                   | 4A                    | <b>Platinum 75 SG</b> (thiamethoxam)                                     | 1.7–4.01 oz  | Do not exceed 4.01 oz/A per growing season.  | 12          | 50                                  | Application restrictions exist for this product because of the risk to bees and other insect pollinators. Follow application restrictions found in the directions for use to protect pollinators.  |
|                   | 4A + 28               | <b>Voliam Flexi</b> (thiamethoxam & chlorantraniliprole)                 | 2–5 oz   | Do not exceed 15.0 oz/A per growing season.  | 12          | 3                                   | 10-day minimum interval between applications.  |
|                   | 4D                    | <b>Sivanto Prime</b> (flupyradifurone)                                   | 7–14 fl oz   | Maximum allowed per year is 28.0 fl oz/A.  | 4           | 0                                   | Do not make more than 2 applications per growing season. Do not apply more than once every 7 days.   |

| Pest | MOA Code <sup>1</sup> | Trade Name (Active Ingredient)  | Rate (Product/Acre)  | Rate per Season                                     | REI (Hours) | Days to Harvest | Notes  |
|------|-----------------------|---|--|---|-------------|-----------------|--|
|      | 7D                    | <b>Esteem 0.86 EC</b> (pyriproxyfen)  | 10 fl oz   | Do not exceed 20 fl oz/A per season.                | 12          | 2               | Do not make more than 2 applications per crop cycle. Allow at least 10 days between applications.  |
|      | 16                    | <b>Courier SC</b> (buprofezin)  | 9.0–13.6 oz  | Do not apply more than 27.2 fl oz/A per crop cycle. | 12          | 3               | Do not make more than 2 applications per crop cycle.   |
|      | 21A                   | <b>Portal XLO</b> (fenpyroximate)   | 2 pints  | Do not apply more than 4.0 pints/A per crop cycle.  | 12          | 1               | Do not make more than 3 applications per crop season.  |
|      | 23                    | <b>Oberon 25C</b> (spiromesifen)  | 12–16 fl oz  | Do not apply more than 48 fl oz/A per crop season.  | 12          | 3               |  |
|      | -                     | <b>BotaniGard ES</b> ( <i>Beauveria bassiana</i> strain GHA)  | 0.25–1 quart   |   | 4           | 0               |  |
|      | -                     | <b>Aza-Direct</b> (azadirachtin)  | See label; 1–2 pints for most pests and crop conditions.               |   | 4           | 0               | OMRI-listed.   |
|      | -                     | <b>Grandevo</b> (Heat-killed <i>Chromobacterium subsugae</i> strain PRAA4-1 and spent fermentation media) | 2–3 lb   |   | 4           | 0               | Can be used in organic production. OMRI-listed. Broad spectrum, repels, reduces fecundity. Tank-mix with a contact insecticide for improved control and resistance management of targeted pests.                     |
|      | -                     | <b>JMS Stylet Oil</b> (paraffinic oil)  | 3 quarts/100 gal water   |   | 4           | 0               |  |
|      | -                     | <b>METS2 EC</b> ( <i>Metarhizium anisopliae</i> strain F52)   | <b>Drench:</b> 40–80 fl oz/100 gal<br><b>Foliar:</b> 0.5 pint–2 quarts |   | 4           | 0               |  |
|      | -                     | <b>M-Pede</b> (potassium salts of fatty acids)  | See label.   |   | 12          | 0               | OMRI-listed. Apply in sufficient water to cover foliage, typically 5–100 gallons per acre.   |
|      | -                     | <b>Mycotrol ESO</b> ( <i>Beauveria bassiana</i> strain GHA)   | 0.25–1 quart   |   | 4           | 0               |  |
|      | -                     | <b>Neemix 4.5% EC</b> (azadirachtin)  | 4–16 fl oz   |   | 12          | 0               | OMRI-listed.   |
|      | -                     | <b>PFR-97 20%WDG</b> ( <i>Isaria fumosoroseus</i> Apopka strain 97)                                       | 1–2 lb   |   | 4           | 0               | OMRI-listed.   |
|      | -                     | <b>SuffOil-X</b> (unsulfonated residue of petroleum oil)  | 1–2 gallons  |   | 4           | 0               | OMRI-listed. Do not make more than 4 applications per year. Minimum retreatment interval is 7 days.  |
|      | -                     | <b>Venerate</b> (Heat-killed <i>Burkholderia rinojensis</i> strain A396)                                  | 2–4 quarts   |   | 4           | 0               | Can be used in organic production. OMRI-listed. Broad spectrum, degrades exoskeleton, interfered with molting. Tank-mix with a contact insecticide for improved control and resistance management of targeted pests. |

<sup>1</sup> Mode of Action (MOA) codes for plant pest insecticides from the Insecticide Resistance Action Committee (IRAC) Mode of Action Classification v. 9.4 March 2020. Number codes (1 through 29) are used to distinguish the main insecticide mode of action groups, with additional letters for certain subgroups within each main group. All insecticides within the same group (with the same number) indicate the same active ingredient or similar mode of action. This information must be considered for the insecticide resistance management decisions. - = unknown, or a mode of action that has not been classified yet.

<sup>2</sup> Information provided in this table applies only to Florida. Be sure to read a current product label before applying any product. The use of brand names and any mention or listing of commercial products or services in the publication does not imply endorsement by UF/IFAS Extension nor discrimination against similar products or services not mentioned. OMRI-listed. Listed by the Organic Materials Review Institute for use in organic production.

\* Restricted use insecticide.

Table 4. Strawberry fungicides ordered by disease and then FRAC group according to their mode of action.

| Pertinent Diseases or Pathogens | Fungicide Group <sup>1</sup>         | Chemical (Active Ingredients)  | Max Rate/Acre                |          | Min. Days to Reentry | Remarks <sup>2</sup>  |  |
|---------------------------------|--------------------------------------|--|------------------------------|----------|----------------------|---|--|
|                                 |                                      |  | Appl.                        | Season   |                      |   |  |
| Angular leaf spot               | M1                                   | (copper compounds)<br><b>Many brands available:</b><br>AmeriCop 40 DF, Badge SC, Basic Copper 53, Badge X2, Champ DP Dry Prill, Champ Formula 2 Flowable, Champ WG, COC DF, COC WP, C-O-C-S WDG, Copper Count-N, CS 2005 Cueva, Cuprofix Ultra 40 Dispers, Cuproxat Flowable, Kentan DF, Kocide 2000, Kocide 3000, Kocide DF, Mastercop, Nordox, Nordox 75WG, Nu Cop 3L, Nu Cop 50 DF, Nu Cop 50 WP, Nu Cop HB, Cuproxat | 0.75 oz                      | 6 oz     | 0                    | 0.5   | Frequent use of copper fungicides may cause foliar burn.   |
|                                 | 21                                   | <b>Actigard 50 WG</b><br>(acibenzolar-s-methyl)  |                              |          | 0                    | 0.5   | Do not apply to plants that are stressed due to drought, excessive moisture, cold weather, herbicide injury, etc.  |
|                                 | M4                                   | (captan)<br><b>Many brands available:</b><br>Captan 50W, Captan 50WP, Captan 80 WDG, Captan 4L   | <b>SEE INDIVIDUAL LABELS</b> |          | 1                    | 1   | Rate per treated acre. Special label for FL allows up to 24 applications per season.   |
|                                 | M4 + 17                              | <b>Captivate 68 WDG</b><br>(captan + fenhexamid)   | 5.25 lb                      | 21 lb    | 0                    | 1   | Do not make more than 2 consecutive applications.  |
|                                 | 1 + 3                                | <b>Protocol</b><br>(thiophanate-methyl + propiconazole)  | 1.33 pt                      | 5.3 pt   | 1                    | 1   | Do not make more than 2 consecutive applications before rotating to another fungicide with a different mode of action.   |
|                                 | 3                                    | (propiconazole)<br><b>Many brands available:</b><br>Ampide Propiconazole EC, Bumper 41.8 EC, Fitness, Orbit, Propi-Star EC, Shar-Shield PPZ, Topaz   | 4 fl oz                      | 16 fl oz | 0                    | 0.5   | Do not make more than 2 consecutive applications.  |
|                                 | 3 + 9                                | <b>Inspire Super</b><br>(difenoconazole + cyprodinil)  | 20 fl oz                     | 80 fl oz | 0                    | 0.5   | Do not make more than 2 sequential applications before alternating to another fungicide with a different mode of action.   |
|                                 | 3 + 11                               | <b>Quadris Top</b><br>(difenoconazole + azoxystrobin)  | 14 fl oz                     | 56 fl oz | 0                    | 0.5   | Do not make more than 2 sequential applications before alternating to another fungicide group, and no more than 4 appl./crop per year.   |
|                                 | 3 + 11                               | <b>Quilt Xcel</b><br>(azoxystrobin + propiconazole)  | 14 oz                        | 56 oz    | 0                    | 0.5   | Do not make more than 2 consecutive applications and no more than 4 appl./crop.  |
|                                 | 9 + 12                               | <b>Switch 62.5 WG</b><br>(cyprodinil + fludioxonil)  | 14 oz                        | 56 oz    | 0                    | 0.5   | Do not make more than 2 consecutive applications. Do not plant crops not on the label for 30 days after last application. See special label for instructions on dipping transplants. |
|                                 | 11                                   | (azoxystrobin)<br><b>Many brands available:</b><br>Abound, Aframe, Azaka, Azoxy 25C, Equation SC, Satori, Trevo  | 15.4 fl oz                   | 1.92 qt  | 0                    | 4 hr  | Do not make more than 2 sequential applications and no more than 4 appl./crop year. See label for instructions on dipping transplants.   |
| 11                              | <b>Cabrio EG</b><br>(pyraclostrobin) | 14 fl oz   | 70 fl oz                     | 0        | 0.5                  | Do not make more than 2 sequential applications and no more than 5 appl./crop year.   |  |
| 11                              | <b>Flint</b><br>(trifloxystrobin)    | 3.2 oz   | 19.2 oz                      | 0        | 0.5                  | Do not apply more than 2 sequential applications of Flint or other Group 11 fungicides. Do not exceed more than 6 total applications of Group 11 fungicides per season. |  |

| Pertinent Diseases or Pathogens | Fungicide Group <sup>1</sup>   | Chemical (Active Ingredients)  | Max Rate/Acre                |            | Min. Days to Harvest | Min. Days to Reentry   | Remarks <sup>2</sup>  |
|---------------------------------|--|--|------------------------------|------------|----------------------|--|---|
|                                 |  |  | Appl.                        | Season     |                      |  |   |
|                                 | 11   | <b>Aftershock Evito</b> (fluoxastrobin)  | 5.7 fl oz                    | 22.8 fl oz | 1                    | 0.5  | Do not make more than 2 sequential applications and no more than 4 applications per season, and leave a minimum interval of 14 days between applications. |
|                                 | 11 + 7   | <b>Merivon</b> (pyraclostrobin + fluxapyroxad)   | 11 fl oz                     | 33 fl oz   | 0                    | 0.5  | Do not make more than 2 sequential applications before alternating to another non-Group 7, non-Group 11 fungicide.  |
|                                 | 11 + 7   | <b>Pristine</b> (pyraclostrobin + boscalid)  | 23 oz                        | 115 oz     | 0                    | 0.5  | Do not make more than 2 consecutive applications, and no more than 5 appl./crop.  |
|                                 | 11 + 7   | <b>Luna Sensation</b> (trifloxystrobin + fluopyram)  | 7.6 fl oz                    | 27.3 fl oz | 0                    | 0.5  | Do not make more than 2 sequential applications before rotating with a fungicide from a different group.  |
|                                 | 19   | <b>Affirm WDG, Ph-D, Oso, Veranda O</b> (polyoxin-D)   | <b>SEE INDIVIDUAL LABELS</b> |            | 0                    | 4 hr   | Use in alternation with fungicides that have different modes of action. Do not make more than 3 applications per season.                                  |
|                                 | 48   | <b>Zivion</b> (natamycin)  | <b>SEE LABEL</b>             |            | n/a                  | 4 hr   | For use as preplant dip of transplants.   |
|                                 | M3   | <b>Thiram Granuflo Thiram 24/7</b> (thiram)  | <b>SEE INDIVIDUAL LABELS</b> |            |                      | 1  | Do not rotate treated crops with other crops for which Thiram is not registered.  |
|                                 | M4   | (captan)<br><b>Many brands available:</b><br>Captan 50W, Captan 50 WP, Captan 80 WDG, Captan 4L  | <b>SEE INDIVIDUAL LABELS</b> |            | 1                    | 1  | Rate per treated acre. Special label for FL allows up to 24 applications per season.  |
|                                 | M4 + 17  | <b>Captivate 68 WDG</b> (captan + fenhexamid)  | 5.25 lb                      | 21 lb      | 0                    | 1  | Do not make more than 2 consecutive applications.   |
|                                 | M12  | <b>Fracture</b> (banda de lupinus albus doce - BLAD)   | 36.6 fl oz                   | 183 fl oz  | 1                    | 4 hr   | Do not make more than 2 sequential applications.  |
|                                 | 1  | (thiophanate-methyl)<br><b>Many brands available:</b><br>Thiophanate-methyl 85 WDG, Topsin 4.5 FL, Topsin 70 WDG, Topsin M 70 WP, Topsin M WSB, Incognito 4.5F, Cercobin, Nufarm T-Methyl 4.5 F, Nufarm T-Methyl 70WSB | <b>SEE INDIVIDUAL LABELS</b> |            | 1                    | 1  | Fungicides from different chemical groups should be used in spray program for disease resistance management.  |
| 1 + 3                           | <b>Protocol</b> (thiophanate-methyl + propiconazole)   | 1.33 pt  | 5.3 pt                       | 1          | 1                    | Do not make more than 2 consecutive applications before rotating to another fungicide with a different mode of action.   |   |
| 2                               | (iprodione)<br><b>Many brands available:</b><br>Enclosure 4, Iprodione 4L AG, Meteor, Nevado 4F, Rovral 4 Flowable | 2 pt   | 2 pt                         | n/a        | 1                    | Do not make more than 1 application per season. Do not apply after first fruiting flower.                                |   |
| 3 + 9                           | <b>Inspire Super</b> (difenoconazole + cyprodinil)   | 20 fl oz   | 80 fl oz                     | 0          | 0.5                  | Do not make more than 2 sequential applications before alternating to another fungicide with a different mode of action. |   |
| 7                               | <b>Fontelis</b> (penthiopyrad)   | 24 fl oz   | 72 fl oz                     | 0          | 0.5                  | Do not make more than 2 sequential applications before alternating to a fungicide from a different group.                |   |
| 7                               | <b>Kenja 400 SC</b> (isofetamid)   | 15.5 fl oz   | 54 fl oz                     | 0          | 0.5                  | Do not plant other crops not registered within 30 days after last application.   |   |
| 7 + 9                           | <b>Luna Tranquility</b> (fluopyram + pyrimethanil)   | 27 fl oz   | 54.7 fl oz                   | 1          | 0.5                  | Do not make more than 2 sequential applications before rotating with a fungicide from a different group.                 |   |
| 7 + 11                          | <b>Luna Sensation</b> (fluopyram + trifloxystrobin)  | 7.6 fl oz  | 27.3 fl oz                   | 0          | 0.5                  | Do not make more than 2 sequential applications before rotating with a fungicide from a different group.                 |   |

| Pertinent Diseases or Pathogens | Fungicide Group <sup>1</sup>                  | Chemical (Active Ingredients)  | Max Rate/Acre                    |            | Min. Days to |         | Remarks <sup>2</sup>   |
|---------------------------------|---|--|----------------------------------|------------|--------------|---------|--|
|                                 |   |  | Appl.                            | Season     | Harvest      | Reentry |  |
|                                 | 7 + 11  | <b>Merivon</b><br>(fluxapyroxad + pyraclostrobin)  | 11 fl oz                         | 33 fl oz   | 0            | 0.5     | Do not make more than 2 sequential applications before alternating to another non-Group 7, non-Group 11 fungicide.   |
|                                 | 7 + 11  | <b>Pristine</b><br>(boscalid + pyraclostrobin)   | 23 oz                            | 115 oz     | 0            | 0.5     | Do not make more than 2 consecutive applications, and no more than 5 appl./crop.   |
|                                 | 9   | <b>Scala SC</b><br>(pyrimethanil)  | 18 fl oz                         | 54 fl oz   | 1            | 0.5     | Do not make more than 2 consecutive applications. Do not use more than 2 of 6 applications in any one season.  |
|                                 | 9 + 12  | <b>Switch 62.5 WG</b><br>(cyprodinil + fludioxonil)  | 14 oz                            | 56 oz      | 0            | 0.5     | Do not make more than 2 consecutive applications. Do not plant crops not on the label for 30 days after last application. See special label for instructions on dipping transplants. |
|                                 | 17  | <b>Elevate 50 WDG</b><br>(fenhexamid)  | 1.5 lb                           | 6 lb       | 0            | 0.5     | Do not make more than 2 consecutive applications.  |
|                                 | 19  | <b>Affirm WDG, Ph-D, Oso, Veranda O</b><br>(polyoxin-D)  | <b>SEE INDIVIDUAL LABELS</b>     |            | 0            | 4 hr    | Use in alternation with fungicides that have different modes of action. Do not make more than 3 applications per season.   |
|                                 | 3 + 11  | <b>Topguard</b><br>(flutriafol + azoxystrobin)   | 8 fl oz                          | 32 fl oz   | 0            | 0.5     | Do not apply more than 4 applications per year.  |
|                                 | 11  | (azoxystrobin)<br><b>Many brands available:</b><br>Abound, Aframe, Azaka, Azoxy 25C, Equation SC, Satori, Trevo  | 15.4 fl oz                       | 1.92 qt    | 0            | 4 hr    | Do not make more than 2 sequential applications, and no more than 4 appl./crop year. See label for instructions on dipping transplants.  |
|                                 | 11  | <b>Cabrio EG</b><br>(pyraclostrobin)   | 14 fl oz                         | 70 fl oz   | 0            | 0.5     | Do not make more than 2 sequential applications and no more than 5 appl./crop year.  |
|                                 | 11  | <b>Flint</b><br>(trifloxystrobin)  | 3.2 oz                           | 19.2 oz    | 0            | 0.5     | Do not apply more than 2 sequential applications of Flint or other Group 11 fungicides. Do not exceed more than 6 total applications of Group 11 fungicides per season.              |
|                                 | 11  | <b>Aftershock Evito</b><br>(fluoxastrobin)   | 5.7 fl oz                        | 22.8 fl oz | 1            | 0.5     | Do not make more than 2 sequential applications, and no more than 4 applications per season; leave a minimum interval of 14 days between applications.                               |
|                                 | <b>Charcoal rot (Macrophomina phaseolina)</b> | 11   | <b>Intuity</b><br>(mandestrobin) | 6 fl oz    | 12 fl oz     | 0       | 0.5  |
| 3                               |   | <b>Rhyme</b><br>(flutriafol)   | 7 fl oz                          | 28 fl oz   | 0            | 0.5     | Product is to be applied through drip irrigation (see label for chemigation directions).   |
| 48                              |   | <b>Zivion</b><br>(natamycin)   | <b>SEE LABEL</b>                 |            | n/a          | 4 hr    | For use as preplant dip of transplants.  |
| 1                               |   | (thiophanate-methyl)<br><b>Many brands available:</b><br>Thiophanate-methyl 85 WDG, Topsin 4.5 FL, Topsin 70 WDG, Topsin M 70 WP, Topsin M WSB, Incognito 4.5F, Cercobin, Nufarm T-Methyl 4.5 F, Nufarm T-Methyl 70WSB | <b>SEE INDIVIDUAL LABELS</b>     |            | 1            | 1       | Fungicides from different chemical groups should be used in spray program for disease resistance management.   |
| 3 + 11                          |   | <b>Topguard</b><br>(flutriafol + azoxystrobin)   | 8 fl oz                          | 32 fl oz   | 0            | 0.5     | Do not apply more than 4 applications per year.  |
| 7                               |   | <b>Kenja 400 SC</b><br>(isofetamid)  | 15.5 fl oz                       | 54 fl oz   | 0            | 0.5     | Do not plant other crops not registered within 30 days after last application.   |

| Pertinent Diseases or Pathogens | Fungicide Group <sup>1</sup> | Chemical (Active Ingredients)  | Max Rate/Acre         |                      | Min. Days to Reentry | Remarks <sup>2</sup>   |
|---------------------------------|------------------------------|--|-----------------------|----------------------|----------------------|--|
|                                 |                              |  | Appl.                 | Season               |                      |  |
| Leaf scorch                     | 1                            | (thiophanate-methyl)<br><b>Many brands available:</b><br>Thiophanate-methyl 85 WDG, Topsin 4.5 FL, Topsin 70 WDG, Topsin M 70 WP, Topsin M WSB, Incognito 4.5F, Cercobin, Nufarm T-Methyl 4.5 F, Nufarm T-Methyl 70WSB | SEE INDIVIDUAL LABELS |                      | 1                    | Fungicides from different chemical groups should be used in spray program for disease resistance management.                           |
|                                 | 1 + 3                        | <b>Protocol</b><br>(thiophanate-methyl + propiconazole)  | 1.33 pt               | 5.3 pt               | 1                    | Do not make more than 2 consecutive applications before rotating to another fungicide with a different mode of action.                 |
| Leaf spot                       | M4                           | (captan)<br><b>Many brands available:</b><br>Captan 50W, Captan 50 WP, Captan 80 WDG, Captan 4L  | SEE INDIVIDUAL LABELS |                      | 1                    | Rate per treated acre. Special label for FL allows up to 24 applications per season.   |
|                                 | 2                            | (iprodione)<br><b>Many brands available:</b><br>Enclosure 4, Iprodione 4L AG, Meteor, Nevado 4F, Rovral 4 Flowable   | 2 pt                  | 2 pt                 | n/a                  | Do not make more than 1 application per season. Do not apply after first fruiting flower.  |
|                                 | 3                            | (propiconazole)<br><b>Many brands available:</b><br>Armitide Propiconazole EC, Bumper 41.8 EC, Orbit, Propi-Star EC, Shar-Shield PPZ, Tilt, Topaz  | 4 fl oz               | 16 fl oz             | 0                    | Do not make more than 2 consecutive applications.  |
|                                 | 3                            | <b>Nova 40W Rally 40WSP Sonoma 40 WSP</b><br>(myclobutanil)  | 5 oz                  | 30 oz                | 0                    | Do not plant rotational crops until 30 days after last application.  |
|                                 | 3                            | <b>Mettle 125 ME</b><br>(tetraconazole)  | 5 fl oz               | 20 fl oz             | 0                    | Do not apply same product within 14 days. Do not apply more than 4 applications per season.  |
|                                 | 3 + 11                       | <b>Quadris Top</b><br>(difenoconazole + azoxystrobin)  | 14 fl oz              | 56 fl oz             | 0                    | Do not make more than 2 sequential applications before alternating to another fungicide group, and no more than 4 appl./crop per year. |
|                                 | 3 + 11                       | <b>Quilt Xcel</b><br>(azoxystrobin + propiconazole)  | 14 oz                 | 56 oz                | 0                    | Do not make more than 2 consecutive applications, and no more than 4 appl./crop.   |
| (suppression only)              | 7 + 9                        | <b>Luna Tranquility</b><br>(fluopyram + pyrimethanil)  | 27 fl oz              | 54.7 fl oz           | 1                    | Do not make more than 2 sequential applications before rotating with a fungicide from a different group.                               |
| (suppression only)              | 7 + 11                       | <b>Luna Sensation</b><br>(fluopyram + trifloxystrobin)   | 7.6 fl oz             | 27.3 fl oz           | 0                    | Do not make more than 2 sequential applications before rotating with a fungicide from a different group.                               |
|                                 | 7 + 11                       | <b>Merivon</b><br>(fluxapyroxad + pyraclostrobin)  | 11 fl oz              | 33 fl oz             | 0                    | Do not make more than 2 sequential applications before alternating to another non-Group 7, non-Group 11 fungicide.                     |
|                                 | 7 + 11                       | <b>Pristine</b><br>(boscalid + pyraclostrobin)   | 23 oz                 | 115 oz               | 0                    | Do not make more than 2 consecutive applications, and no more than 5 appl./crop.   |
|                                 | 11                           | <b>Cabrio EG</b><br>(pyraclostrobin)   | 14 fl oz              | 70 fl oz             | 0                    | Do not make more than 2 sequential applications, and no more than 5 appl./crop year.   |
| Leather rot                     | 3 + 11                       | <b>Topguard</b><br>(flutriafol + azoxystrobin)   | 8 fl oz               | 32 fl oz             | 0                    | Do not apply more than 4 applications per year.  |
|                                 | 4                            | <b>Ridomil Gold EC Ridomil Gold SL Ultra Flourish</b><br>(mefenoxam)   | 1 pt/treated acre     | 1.5 qt/ treated acre | 0                    | See label for use in drip irrigation.  |
|                                 | 4                            | <b>Metalaxyl 2E AG MetaStar 2E AG</b><br>(metalaxyl)   | 2 qt                  | 6 qt                 | 0                    | See label for use in drip irrigation.  |

| Pertinent Diseases or Pathogens | Fungicide Group <sup>1</sup> | Chemical (Active Ingredients)  | Max Rate/Acre                |                         | Min. Days to |         | Remarks <sup>2</sup>  |
|---------------------------------|------------------------------|--|------------------------------|-------------------------|--------------|---------|---|
|                                 |                              |  | Appl.                        | Season                  | Harvest      | Reentry |   |
|                                 | 11                           | (azoxystrobin)<br><b>Many brands available:</b><br>Abound, Aframe, Azaka, Azoxy 25C, Equation SC, Satori, Trevo  | 15.4 fl oz                   | 1.92 qt                 | 0            | 4 hr    | Do not make more than 2 sequential applications, and no more than 4 appl./crop year. See label for instructions on dipping transplants.                                 |
|                                 | 33                           | <b>Allette WDG</b><br><b>Legion 80WDG</b><br><b>Linebacker WDG</b><br>(fosetyl-AI)   | 5 lb                         | 30 lb                   | 0.5          | 0.5     | Do not tank-mix with copper fungicides, adjuvants, or foliar fertilizers.   |
|                                 | 33                           | <b>Alude, Confine Extra, Fosphite, Fungi-Phite, K-Phite, Phorcephite, Phostrol, Rampart</b>  | <b>SEE INDIVIDUAL LABELS</b> |                         | 0            | 4 hr    | Do not tank-mix with copper fungicides.   |
| <b>Phomopsis leaf blight</b>    | 3                            | <b>Mettle 125 ME</b><br>(tetraconazole)  | 5 fl oz                      | 20 fl oz                | 0            | 0.5     | Do not apply same product within 14 days. Do not apply more than 4 applications per season.   |
|                                 | 3                            | <b>Nova 40W</b><br><b>Rally 40WSP</b><br><b>Sonoma 40 WSP</b><br>(myclobutanil)  | 5 oz                         | 30 oz                   | 0            | 1       | Do not plant rotational crops until 30 days after last application.   |
| (suppression only)              | 11                           | <b>Flint</b><br>(trifloxystrobin)  | 3.2 oz                       | 19.2 oz                 | 0            | 0.5     | Do not apply more than 2 sequential applications of Flint or other Group 11 fungicides. Do not exceed more than 6 total applications of Group 11 fungicides per season. |
| (suppression only)              | 7 + 9                        | <b>Luna Tranquility</b><br>(fluopyram + pyrimethanil)  | 27 fl oz                     | 54.7 fl oz              | 1            | 0.5     | Do not make more than 2 sequential applications before rotating with a fungicide from a different group.  |
|                                 | 7 + 11                       | <b>Luna Sensation</b><br>(fluopyram + trifloxystrobin)   | 7.6 fl oz                    | 27.3 fl oz              | 0            | 0.5     | Do not make more than 2 sequential applications before rotating with a fungicide from a different group.  |
| <b>Phomopsis soft rot</b>       | 2                            | (iprodione)<br><b>Many brands available:</b><br>Enclosure 4, Iprodione 4L AG, Meteor, Nevada 4F, Rovral 4 Flowable   | 2 pt                         | 2 pt                    | n/a          | 1       | Do not make more than 1 application per season. Do not apply after first fruiting flower.   |
| (suppression only)              | 7 + 9                        | <b>Luna Tranquility</b><br>(fluopyram + pyrimethanil)  | 27 fl oz                     | 54.7 fl oz              | 1            | 0.5     | Do not make more than 2 sequential applications before rotating with a fungicide from a different group.  |
|                                 | 7 + 11                       | <b>Luna Sensation</b><br>(fluopyram + trifloxystrobin)   | 7.6 fl oz                    | 27.3 fl oz              | 0            | 0.5     | Do not make more than 2 sequential applications before rotating with a fungicide from a different group.  |
| <b>Phytophthora crown rot</b>   | 4                            | <b>Metalaxyl 2E AG</b><br><b>MetaStar 2E AG</b><br>(metalaxyl)   | 2 qt                         | 6 qt                    | 0            | 2       | See label for use in drip irrigation.   |
|                                 | 4                            | <b>Ridomil Gold EC</b><br><b>Ridomil Gold SL</b><br><b>Ultra Flourish</b><br>(mefenoxam)   | 1 pt/treated acre            | 1.5 qt/<br>treated acre | 0            | 2       | See label for use in drip irrigation.   |
| <b>Powdery mildew</b>           | 33                           | <b>Alude, Confine Extra, Fosphite, Fungi-Phite, K-Phite, Phorcephite, Phostrol, Rampart</b><br>(sulfur)  | <b>SEE INDIVIDUAL LABELS</b> |                         | 0            | 4 hr    | Do not tank-mix with copper fungicides.   |
|                                 | M2                           | <b>Many brands available:</b><br>Acotald, Cosavet DF, Crusade DF, Kumulus DF, Micro Sulf, Microfine Sulfur, Microthiol Dispers, Rebel DF, Sulfur 90W, Wettable Sulfur, Wettable Sulfur 92, Yellow Jacket Dusting Sulfur, Yellow Jacket Wettable Sulfur | <b>SEE INDIVIDUAL LABELS</b> |                         | 1            | 1       | Do not use during hot weather.  |
|                                 | M2 + 33                      | <b>Sanction</b><br>(potassium phosphate + sulfur)  | 6 pt                         | 24 pt                   | n/a          | 1       | Do not apply during hot weather. May cause injury during certain climatic conditions.   |
|                                 | M12                          | <b>Fracture</b><br>(banda de lupinus albus doce - BLAD)  | 24.4 fl oz                   | 122 fl oz               | 1            | 4 hr    | Do not make more than 2 sequential applications.  |

| Pertinent Diseases or Pathogens | Fungicide Group <sup>1</sup> | Chemical (Active Ingredients)  | Max Rate/Acre                |            | Min. Days to Harvest | Min. Days to Reentry | Remarks <sup>2</sup>   |
|---------------------------------|------------------------------|--|------------------------------|------------|----------------------|----------------------|--|
|                                 |                              |  | Appl.                        | Season     |                      |                      |  |
|                                 | 1                            | (thiophanate-methyl)<br><b>Many brands available:</b><br>Thiophanate-methyl 85 WDG, Topsin 4.5 FL, Topsin 70 WDG, Topsin M 70 WP, Topsin M WSB, Incognito 4.5F, Cercobin, Nufarm T-Methyl 4.5 F, Nufarm T-Methyl 70WSB | <b>SEE INDIVIDUAL LABELS</b> |            | 1                    | 1                    | Fungicides from different chemical groups should be used in spray program for disease resistance management.   |
|                                 | 1 + 3                        | <b>Protocol</b><br>(thiophanate-methyl + propiconazole)  | 1.33 pt                      | 5.3 pt     | 1                    | 1                    | Do not make more than 2 consecutive applications before rotating to another fungicide with a different mode of action.   |
|                                 | 3                            | (propiconazole)<br><b>Many brands available:</b><br>Amite Propiconazole EC, Bumper 41.8 EC, Bumper ES, Orbit, Propi-Star EC, Shar-Shield PPZ, Tilt, Topaz  | 4 fl oz                      | 16 fl oz   | 0                    | 0.5                  | Do not make more than 2 consecutive applications.  |
|                                 | 3                            | <b>Nova 40W Rally 40WSP Sonoma 40 WSP</b><br>(myclobutanil)  | 5 oz                         | 30 oz      | 0                    | 1                    | Do not plant rotational crops until 30 days after last application.  |
|                                 | 3                            | <b>Procare 480 SC</b><br>(triflumizole)  | 8 oz                         | 32 oz      | 1                    | 0.5                  | Do not plant leafy vegetables within 30 days, root vegetables within 60 days, or rotational crops not on label for one year after application.                 |
|                                 | 3                            | <b>Mettle 125 ME</b><br>(tetraconazole)  | 5 fl oz                      | 20 fl oz   | 0                    | 0.5                  | Do not apply same product within 14 days. Do not apply more than 4 applications per season.  |
|                                 | 3                            | <b>Rhyme</b><br>(flutriafol)   | 7 fl oz                      | 28 fl oz   | 0                    | 0.5                  | Do not apply more than 4 applications per year.  |
|                                 | 3 + 9                        | <b>Inspire Super</b><br>(difenoconazole + cyprodinil)  | 20 fl oz                     | 80 fl oz   | 0                    | 0.5                  | Do not make more than 2 sequential applications before alternating to another fungicide with different mode of action.   |
|                                 | 3 + 11                       | <b>Topguard</b><br>(flutriafol + azoxystrobin)   | 8 fl oz                      | 32 fl oz   | 0                    | 0.5                  | Do not apply more than 4 applications per year.  |
|                                 | 3 + 11                       | <b>Quadris Top</b><br>(difenoconazole + azoxystrobin)  | 14 fl oz                     | 56 fl oz   | 0                    | 0.5                  | Do not make more than 2 sequential applications before alternating to another fungicide group, and no more than 4 appl./crop per year.                         |
|                                 | 3 + 11                       | <b>Quilt Xcel</b><br>(azoxystrobin + propiconazole)  | 14 oz                        | 56 oz      | 0                    | 0.5                  | Do not make more than 2 consecutive applications, and no more than 4 appl./crop.   |
|                                 | 7                            | <b>Fontelis</b><br>(penthiopyrad)  | 24 fl oz                     | 72 fl oz   | 0                    | 0.5                  | Do not make more than 2 sequential applications before alternating to a fungicide from a different group.  |
|                                 | 7                            | <b>Kenja 400 SC</b><br>(isofetamid)  | 15.5 fl oz                   | 54 fl oz   | 0                    | 0.5                  | Do not plant other crops not registered within 30 days after last application.   |
|                                 | 7                            | <b>Luna Privilege</b><br>(fluopyram)   | 6.84 fl oz                   | 13.7 fl oz | 0                    | 0.5                  | Apply through drip irrigation system preventatively. Do not make more than 2 sequential applications before alternating to a fungicide from a different group. |
|                                 | 7 + 9                        | <b>Luna Tranquility</b><br>(fluopyram + pyrimethanil)  | 27 fl oz                     | 54.7 fl oz | 1                    | 0.5                  | Do not make more than 2 sequential applications before rotating with a fungicide from a different group.   |
|                                 | 7 + 11                       | <b>Luna Sensation</b><br>(fluopyram + tryfloxystrobin)   | 7.6 fl oz                    | 27.3 fl oz | 0                    | 0.5                  | Do not make more than 2 sequential applications before rotating with a fungicide from a different group.   |
|                                 | 7 + 11                       | <b>Merivon</b><br>(pyraclostrobin + fluxapyroxad)  | 11 fl oz                     | 33 fl oz   | 0                    | 0.5                  | Do not make more than 2 sequential applications before alternating to another non-Group 7, non-Group 11 fungicide.   |
|                                 | 7 + 11                       | <b>Pristine</b><br>(pyraclostrobin + boscalid)   | 23 oz                        | 115 oz     | 0                    | 0.5                  | Do not make more than 2 consecutive applications, and no more than 5 appl./crop.   |

| Pertinent Diseases or Pathogens | Fungicide Group <sup>1</sup> | Chemical (Active Ingredients)   | Max Rate/Acre                |            | Min. Days to |         | Remarks <sup>2</sup>  |
|---------------------------------|------------------------------|---|------------------------------|------------|--------------|---------|---|
|                                 |                              |   | Appl.                        | Season     | Harvest      | Reentry |   |
|                                 | 11                           | (azoxystrobin)<br><b>Many brands available:</b><br>Abound, Aframe, Azaka, Azoxy 25C, Equation SC, Satori, Trevo | 15.4 fl oz                   | 1.92 qt    | 0            | 4 hr    | Do not make more than 2 sequential applications, and no more than 4 appl./crop year. See label for instructions on dipping transplants.                                 |
|                                 | 11                           | <b>Cabrio EG</b><br>(pyraclostrobin)  | 14 fl oz                     | 70 fl oz   | 0            | 0.5     | Do not make more than 2 sequential applications, and no more than 5 appl./crop year.  |
|                                 | 11                           | <b>Flint</b><br>(trifloxystrobin)   | 3.2 oz                       | 19.2 oz    | 0            | 0.5     | Do not apply more than 2 sequential applications of Flint or other Group 11 fungicides. Do not exceed more than 6 total applications of Group 11 fungicides per season. |
|                                 | 11                           | <b>Aftershock Evito</b><br>(fluoxastrobin)  | 5.7 fl oz                    | 22.8 fl oz | 1            | 0.5     | Do not make more than 2 sequential applications, and no more than 4 applications per season; leave a minimum interval of 14 days between applications.                  |
|                                 | 11                           | <b>Intuity</b><br>(mandestrobin)  | 6 fl oz                      | 12 fl oz   | 0            | 0.5     | Do not make more than 2 applications per year. Do not apply at intervals of less than 14 days.  |
|                                 | 13                           | <b>Quintec</b><br>(quinoxifen)  | 6 fl oz                      | 24 fl oz   | 1            | 0.5     | Do not make more than 2 consecutive applications or more than 4 applications per crop.  |
|                                 | 19                           | <b>Affirm WDG, Ph-D, Oso, Veranda O</b><br>(polyoxin-D)   | <b>SEE INDIVIDUAL LABELS</b> |            | 0            | 4 hr    | Use in alternation with fungicides that have different modes of action. Do not make more than 3 applications per season.  |
|                                 | U6                           | <b>Torino</b><br>(cyflufenamid)   | 3.4 oz                       | 6.8 oz     | 0            | 4 hr    | Do not make more than 2 applications per year. Do not apply more than once every 14 days.   |
|                                 | U8                           | <b>Prolivo</b><br>(pyriofenone)   | 5 fl oz                      | 16 fl oz   | 0            | 4 hr    | Do not make more than 2 sequential applications of Group U8 fungicides before rotating to a fungicide with a different mode of action.                                  |

<sup>1</sup> FRAC code (fungicide group): Number (1 through 46) and letters (U and P) are used to distinguish the fungicide mode of action groups. All fungicides within the same group (with the same number or letter) indicate the same active ingredient or similar mode of action. This information must be considered for the fungicide resistance management decisions. U = unknown, or a mode of action that has not been classified yet and is typically associated with another number; P = host plant defense inducers. Source: FRAC Code List 2019; <http://www.frac.info/> (FRAC = Fungicide Resistance Action Committee).

<sup>2</sup> Information provided in this table applies only to Florida. Be sure to read a current product label before applying any chemical. The use of brand names and any mention or listing of commercial products or services in the publication does not imply endorsement by UF/IFAS Extension nor discrimination against similar products or services not mentioned.

Table 5. Nonfumigant nematicides for strawberry in Florida.

| Product                    | Application Rates and Procedures   |
|----------------------------|--|
| Nimitz (a.i. fluensulfone) | All applications must be incorporated either physically or via drip or overhead irrigation. Make preplant applications at a rate of 3.5 to 7 pints (56.0 to 80.0 fl. oz.) per acre a minimum of seven days before planting. Do not plant any unlisted crops into treated land for 365 days after application of the product. Do not apply more than one application per crop and no more than 112 fl oz of product per acre per year (365 days). Provides control only for nematodes. Growers applying Nimitz must consult the product label to observe the plant-back (recropping) intervals for a variety of leafy vegetables and brassica crops, onions, bananas, sugarcane, and other crops. |
| Velum (a.i. fluopyram)     | Apply max 6.84 fl oz/acre using only chemigation into root zone through low-pressure drip, trickle, microsprinkler, or equivalent equipment. Observe minimum 7-day interval between soil applications. Do not apply more than 13.7 fl oz of Velum (0.446 lb fluopyram) per acre per year, regardless of formulation (Velum and/or Luna) or method of application (soil or foliar). For soil application, to limit the potential for development of disease resistance to this chemical class, the first foliar fungicide application after Velum should be a product from a different FRAC group.  |

Velum is a fungicide/nematicide; Nimitz is a true nematicide. Unlike fumigants, these products are not volatile and will move through the soil via water; depending on the water solubility, these products will have different recommendations for how to best apply them (see specific label recommendations); when nematode pressure is high, they may not be as consistently effective against root nematodes as the fumigants.

Table 6. Fumigant nematicides for strawberry in Florida.

| Nematicide   | Broadcast Application <sup>1</sup> |                                       | In-the-Row Applications   |
|--|------------------------------------|---------------------------------------|---|
|  | Gallons or lb per Acre             | fl oz/1000 ft/chisel-spaced 12" apart |   |
| Telone II <sup>2,3</sup><br>Telone EC <sup>2,3</sup> | 27 to 35 gal                       | 79 to 102                             | For any row spacing, application rates given may be concentrated in the row but shall never exceed the labeled maximum for broadcast applications. Consult the product label for additional detail. |
| Telone C-17 <sup>2,3</sup>                           | 32.4 to 42 gal                     | 95 to 123                             | For any row spacing, application rates given may be concentrated in the row but shall never exceed the labeled maximum for broadcast applications. Consult the product label for additional detail. |
| Telone C-35 <sup>2,3</sup>                           | 39 to 50 gal                       | 114 to 146                            | For any row spacing, application rates given may be concentrated in the row but shall never exceed labeled maximum for broadcast applications. Consult the product label for additional detail.     |
| Telone InLine <sup>2,3</sup>                         | 29 to 56 gal                       | -                                     | For drip fumigation, consult the product label for overall rate, drip concentration, and flow-modifying application directions.   |
| Pic Clor 60 <sup>2,3</sup>                           | 19.5 to 31.5 gal                   | 57 to 90                              | Consult product label for overall rate and chisel flow-modifying application directions.  |
| Pic Clor 60 EC <sup>2,3</sup>                        | 19.5 to 31.5 gal                   | -                                     | For drip fumigation, consult product label for proportionately reduced overall rates, drip concentration, and drip flow-modifying directions and procedures.  |
| Vapam HL   | 75 gal                             | -                                     | For drip fumigation and crop termination, consult product label for proportionately reduced overall rates, drip concentration, and flow-modifying directions and procedures.                        |
| KPam HL  | 60 gal                             | -                                     | For drip fumigation and crop termination, consult product label for proportionately reduced overall rates, drip concentration, and flow-modifying directions.                                       |
| Allyl Isothiocyanate (AITC)<br>Dominus               | 40 gal                             | -                                     | For drip or in-row fumigation and crop termination, consult product label for overall rates, drip concentration, and flow-modifying directions.   |

<sup>1</sup>Gallons/acre and fl oz/1000 feet provided only for mineral soils. Higher rates may be possible for heavier-textured (loam, silt, clay) or highly organic soils.  
<sup>2</sup>All of the fumigants mentioned are for retail sale and use only by state-certified applicators or persons under their direct supervision. New supplemental labeling for the Telone products must be in the hands of the user at the time of application. See label details for additional use restrictions based on soil characteristics, buffer zones, requirements for personal protective equipment (PPE), mandatory good agricultural practices (GAPs), product and applicator training certification, and rate-modifying recommendations with use of highly retentive Totally Impermeable mulch films (TIF).  
<sup>3</sup>Higher application rates are possible in the presence of cyst-forming nematodes.

Rates are believed to be correct for products named, and similar products of other brand names, when applied to mineral soils. Higher rates are required for muck (organic) soils. However, the **grower** has the final responsibility to see that each product is used legally; **read the label** of the product to be sure that you are using it properly.