

# Fruit and Nuts – Commercial Uses

## Apple Spray Schedule

### Dormant (apply in December or January)

**Table 1. San Jose scale (when present)**

Materials/ Insecticides	To Make 50 Gallons	Precautions
Oil emulsion 3% actual oil in diluted spray.	Follow the recommendations of the manufacturer for mixing.	Use 2 applications 7-10 days apart prior to bud break with no time limit.
Imidan (Phosmet) 70W	0.5-1.28 pounds	PHI=14 days; highly toxic to bees. Do not use in home gardens. Not to exceed 5.125 pounds A.I./acre.
Esteem 35WP (Pyriproxyfen)	0.5-0.62 ounce or (= 4-5 ounces/acre)	<ul style="list-style-type: none"> <li>• PHI=45 days; limit to 2 applications per season.</li> <li>• Allow 14 days between applications. Apply at delayed dormant thru pink. For delayed dormant, mix with oil emulsion at the recommended manufacturer's rate. Must be timed to coincide with crawler emergence.</li> </ul>
Proaxis (Gamma-cyhalothrin)	0.427-0.853 fluid ounce	PHI=21 days; do not apply more than 0.1 pound A.I./acre/season.

### Calyx (apply when three-fourths of petals have fallen)

**Table 2. Catfacing insects**

Materials/ Insecticides	To Make 50 Gallons	Precautions
Imidan (Phosmet) 70W	0.5-1.28 pounds	See above information on Imidan.

**Table 3. Leafrollers, scales, leafhoppers**

Materials/ Insecticides	To Make 50 Gallons	Precautions
SpinTor 2SC (Spinosad –mixture of Spinosyn A and D)	0.62-1.25 fluid ounce	PHI=7 days. Not labeled to control scales.

**Table 4. Thrips**

Materials/ Insecticides	To Make 50 Gallons	Precautions
Carbaryl 50% WP (Sevin) follow label in other Carbaryl (Sevin) formulations	0.5-1.0 pound	PHI=3 days; highly toxic to bees; avoid during periods of full bloom until 30 days after full bloom. Allow 14 days between sprays. Use higher rate of Carbaryl 50WP for apple maggot, leafrollers, wooly apple aphid, plum curculio. Carbaryl might promote mite infestations.
Pounce (Permethrin) 3.2EC	1.25 fluid ounce (=10 fluid ounce/acre)	Do not apply after petal fall. Follow label.
Proaxis (Gamma-cyhalothrin)	0.427-0.853 fluid ounce	PHI=21 days; do not apply more than 0.1 lb A.I./acre/season.

**Table 5. Aphids (not wooly apple aphid)**

Materials/ Insecticides	To Make 50 Gallons	Precautions
Provado 1.6F (Imidacloprid)	1.0-2.0 fluid ounce	PHI=7 days; apply post-bloom only.

**Table 6. Leafhoppers**

Materials/ Insecticides	To Make 50 Gallons	Precautions
Provado 1.6F (Imidacloprid)	0.5-1.0 fluid ounce	Provado is highly toxic to bees and aquatic invertebrates. Toxic to wildlife. Allow 10 or more days between applications. Do not apply more than 40 fluid ounce per acre per year.
Mustang Max (Zeta-cypermethrin)	0.21-0.32 fluid ounce	PHI=14 days; allow 7 days between applications.

**Table 7. Mites**

Materials/ Insecticides	To Make 50 Gallons	Precautions
Nexter (Pyridaben)	5.2-10.67 ounces/acre	PHI=25 days; Do not make more than one application per season. Apply at the beginning of mite infestations.
Savey 50DF (Hexythiazox)	3.0-6.0 ounces/acre	PHI=28 days; limit to 1 application per year. Apply at the beginning of mite infestations.

**Apply cover sprays at 10- to 14-day intervals**

**Warning:** Re-entry time for a worker entering treated areas should be strictly observed. Read the label for this information.

**Note:** Chemical should be applied at a rate of 200-300 gallons/acre for adequate coverage with the material.

## Citrus Spray Schedule

**Note:** Selection of proper materials and timing of application are of primary importance for effective control of insects and diseases of citrus. The rate of pesticide product per 100 gallons used in this guide is based on a volume of 400 gallons/acre of diluted spray.

**Prebloom: Jan. 15-Feb. 15**

**Satsuma, Grapefruit, Temple, Valencia, Lemon, Tangelo, Tangerine**

**Table 1. Spider mites**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Nexter 75WP (Pyridaben)	6.6 ounces (one water-soluble packet/acre)	See label.	See label.	PHI = Seven days; do not make more than two applications/year. Allow 30 days between treatments at the lowest labeled rate. Higher rates require longer intervals. Highly toxic to bees, fish, and aquatic invertebrates. Read label.

**Table 2. Rust mites**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Micromite 80WGS (Diflubenzuron) + 97% petroleum-based oil	6¼ fluid ounces (two water-soluble packet/acre)	See label.	See label.	Micromite 80WGS: PHI = 21 days; do not mix with boron products. Use sufficient water to ensure coverage. Applications may be repeated no less than 90 days apart. Active on eggs and nymphal stages but not on adult rust mites. Results are visible three to 10 days after application.
Sulfur	See label.	See label.	See label.	Limit sulfur applications to one per season where supplemental rust mite control is needed. Do not mix with oils and/or do not apply within three weeks of oil applications to avoid fruit burn. Some sulfur formulations should not be combined with spreaders/stickers. Follow the labeled rate. Do not use more than 6 lb/100 gallons.

**Table 3. Asian citrus psyllid**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Danitol 2.4EC (Fenpropathrin) + Horticultural oil	16-21 fluid ounces + 5 pints	See label.	See label.	Use for control of overwintering adults. Do not apply if harvesting fruit. PHI = 1 day (Danitol); do not exceed 2 2/3 pints of Danitol per season. Sulfur may cause irritation to eyes. Avoid contact with eyes, skin, and, clothing. To avoid foliage/fruit burn, do not apply sulfur products when hot temperatures (above 90 F) are expected within three days of spraying. <b>NOTE:</b> Lime sulfur use – do not use this material on tangerine trees during late winter and early spring.

**Postbloom: All citrus (satsumas - when 75% petals have fallen, other oranges - when pea size.)**

**Table 4. Scales, thrips**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Malathion 57EC (Malathion)	5-7½ pints	1¾ pints	2 teaspoons	Malathion: PHI = Seven days; Malathion is highly toxic to honeybees. Do not apply during full bloom. Nutritional mixtures should not be used in combination with oil sprays.
Malathion 8F (Malathion)	6 pints	1½ pints	1½ teaspoons	

**Table 5. Scales, mealybugs, whiteflies, citrus, blackflies, Asian citrus psyllids**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Supracide 2E (Methidathion)		½-2 pints	½-2 teaspoons	PHI = 14 days; make no more than 2 applications per season. Allow 45-day intervals between sprays; highly toxic to bees; do not apply during full bloom. In lemons do not apply more than once if tank-mixed with oil. PHI = 5 days; do not apply more than 20 quarts/acre/crop.
Supracide 2E Plus (Methidathion)		1-2 pints	1-2 teaspoons	Follow label.
Sevin XLR plus (Carbaryl)	1.5 quarts	See label.	See label.	

**Table 6. Scales, whiteflies, citrus blackflies, spider mites, rust mites**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Esteem 0.86 EC (Pyriproxyfen) + 1% Superior oil	16 fluid ounces	See label.	See label.	PHI = 1 day; use sufficient water to ensure enough coverage. Apply when scales are at crawler (young) stage; maximum 2 applications/season; allow 21 days between sprays.
Nexter 75WP (Pyridaben)	6.6 ounces (1 water-soluble packet/acre)	See label.	See label.	See preceding remarks on Nexter.
Vendex 50WP (Fenbutatin-oxide) +	2-3 pounds (2-3 water-soluble packets/acre)	8-12 ounces	1-1½ teaspoons	PHI = 7 days; apply when daily temperatures at application average above 70 F and when mite populations are beginning to build for best performance. Complete coverage is needed for optimum control. Limit to 2 applications/year at 60-day intervals. Do not use Vendex on tangerines, tangelos, Reed grapefruit or Webb red blush grapefruit.
Latron CS 7	See label	1 quart	See label.	

**Table 7. Thrips**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
SpinTor 2SC (Spinosad)	6 fluid ounces	See label.	See label.	PHI = 1 day; do not spray more than 29 fluid ounces/acre/crop or more than 2 applications/year. For best results, add emulsified crop oil (follow label).

**80% Petal Fall: All Citrus****Table 8. Rust mites, broad mites, bud mites, two-spotted spider mites, citrus thrips**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Agri-mek 0.15 EC (Abamectin) +	5-20 fluid ounces	1¼-5 ounces	¼ teaspoon	PHI = 7 days; always apply with a minimum of 0.20% horticultural (not dormant) spray oil. Allow 30 days between treatments. Do not apply more than 40 fluid ounces/acre/season; highly toxic to honeybees. For best results use a minimum of 500 gallons/acre of spray and no less than 0.5% oil for citrus bud mites; 100-150 gallons/acre spray for citrus leafminers; 100-250 gallons/acre spray for citrus thrips and adjust the rate of product/acre accordingly. Use caution when applying oils, read the label and do not spray when temperatures exceed 85 F.
Ultra fine oil	10-20 fluid ounce	2½-5 ounces	¼ teaspoon	

**Table 9. Rust mites**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Micromite 80WGS (Diflubenzuron) + 97% petroleum-based oil	6¼ fluid ounces (two water-soluble packet/acre)	See label.	See label.	PHI = 21 days; do not mix with boron products. Use sufficient water to ensure coverage. Applications may be repeated no less than 90 days apart; active on eggs and nymphal stages but not on adult rust mites; results visible 3-10 days after application.

**Table 10. Leafminers**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Assail 70WP (Acetamiprid)	2 ounces	See label.	See label.	PHI = 7 days; toxic to bees exposed to direct treatment.

**Table 11. Leafminers, thrips**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Spintor 2SC (Spinosad)	6 fluid ounces	See label.	See label.	PHI = 1 day; do not spray more than 29 fluid ounces/acre/crop or more than 2 applications/year. For best results add emulsified crop oil (follow label).

**Table 12. Aphids, citrus thrips, Asian citrus psyllid**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Admire Pro 4F (Imidacloprid)	3.5-7.0 fluid ounces	See label.	See label.	Admire Pro: PHI = 0 days; do not apply during bloom or 10 days prior to bloom; limit to 20 ounces/acre/application and 40 ounces/acre/year; allow at least 10 days between applications. Limit 14.0 fluid ounces/acre per crop season.
Admire 2F (soil-applied systemic) (Imidacloprid)	16-32 fluid ounces (or 1/8 fluid ounce/tree)	See label.	See label.	Admire 2F: PHI = 0 days; intended for containerized trees and young trees (4 ft-6 ft height); apply as soil drench. For best results apply prior to the onset of infestations. See label for soil application options.

**April: All Citrus****Table 13. Fire ants**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Extinguish IGR (Methoprene)	1-1½ pounds	3-5 tablespoons/mound	See label.	Apply when ants are actively foraging.

**June 15-July 15: All Citrus****Table 14. Thrips, leafminers**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
SpinTor 2SC (Spinosad)	6 fluid ounces	See label.	See label.	See the above preceding remarks on SpinTor.
Agri-mek 0.15 EC (Abamectin)	See label.	See label.	See label.	See preceding remarks.
Admire Pro 4F (Imidacloprid)	3.5-7.0 fluid ounces	See label.	See label.	PHI = 0 day; minimum interval between applications-10 days; maximum Admire Pro allowed per crop season – 40.0 fluid ounces/acre (0.5 lb AI/acre). Do not apply during bloom or within 10 days prior to bloom or when bees are actively foraging.

**Table 15. Rust mites**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Agri-mek 0.15 EC (Abamectin)	5-20 fluid ounces	1¼ -5 ounces	¼ teaspoon	See above preceding remarks on Agri-mek. Rate varies depending on insect/ mite control; refer to label.



**Table 16. Broad mites, bud mites, two-spotted spider mites**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Agri-mek 0.15 EC (Abamectin) +Ultra fine oil	5-20 fluid ounces + 10-20 fluid ounces/acre	1¼ -5 ounces + 2½ -5 ounces	¼ teaspoon + ¼ teaspoon	Always use caution when spraying oil and oil combinations; read the label; do not apply when temperatures exceed 85 F; see footnotes.

**Table 17. Rust mites. leafminers**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Micromite 80WGS (Diflubenzuron) + 97% petroleum-based oil	6¼ fluid ounces (two water-soluble packet/acre)	See label.	See label.	See previous remarks on Micromite 80WGS.

**Table 18. Mites (general)**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Ultra fine oil	See label.	1¼-1¾ gallons	3-4½ tablespoons	Always use caution when spraying oil and oil combinations; read the label. Do not apply when temperatures exceed 85 F; see footnotes.

**Table 19. Spider mites, whiteflies, mealybugs, scales, aphids**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Summer oil +	See label.	1-1½ gallons	2½-4 tablespoons	See above for Malathion remarks.
Malathion 57EC (Malathion)	5-7½ pints	1¾ pints	2 teaspoons	

**Table 20. Asian citrus psyllid, aphids, scales**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Danitol (Fenpropathrin) +	16-21 1/3 fluid ounces	See label.	See label.	Use for control of overwintering adults; do not apply if harvesting fruit; PHI = 1 day; do not exceed 2 2/3 pints of Danitol/season.
Summer Oil	4-7 pints	1-1 3/4 pints	1-2 teaspoons	

**Table 21. Mealybugs, whiteflies, citrus blackflies, black scales**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Supracide 2E (Methidathion)	See label.	1/2-2 pints	1/2-2 teaspoons	See preceding remarks on Supracide.

**Aug. 14-Sept. 15: All Citrus****Table 22. Aphids**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Admire Pro 4F (Imidacloprid)	3.5-7.0 fluid ounces	See label.	See label.	See above for remarks.

**Table 23. Leaf-footed bugs**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Baythroid 2E (Cyfluthrin)	2-2.4 fluid ounces	See label.	See label.	Baythroid 2: PHI = 0 days; coverage of foliage and fruits is necessary for optimal results. Use 2-3 gallons of spray/tree. If multiple applications are needed may make a first spray at 2.4 fluid ounces/acre and 2 additional sprays of 2 fluid ounces/acre at a minimum of 7-day intervals. Maximum amount/season is 6.4 fluid ounces/acre (or 0.10 lb active ingredient/acre/season).

**Table 24. Scales, plant bugs**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Malathion 57EC (Malathion)	5-7½ pints	1¾ pints	2 teaspoons	See above for remarks on Malathion.

**Table 25. Citrus blackflies, whiteflies, mealybugs, scales, plant bugs**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Ultra fine oils	See label.	1½ gallons	4 tablespoons	Oils may be used with all materials, particularly against whiteflies, mites, and scales; however, read the footnotes for important information.
Supracide2E (Methidathion)	See label.	½-2 pints	½-2 teaspoons	Follow label

**Table 26. Spider mites, rust mites**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Vendex 50WP (Fenbutatin-oxide) +	2-3 pounds (2-3 water-soluble packets/acre)	8-12 ounces	1-1½ teaspoons	See preceding remarks and temperature requirements for Vendex.
Latron CS 7	See label	1 quart	See label.	Follow label
Nexter 75WP (Pyridaben)	6.6 ounces (1 water-soluble packet/acre)	See label.	See label.	See preceding limitations.

**Table 27. Asian citrus psyllid**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Mustang Maxx (Zeta-cyprmethrin)	4.3 fluid ounces	See label.	See label.	PHI = 1 day; apply by ground equipment using sufficient water to obtain full coverage of foliage in a minimum of 20 gallons for concentrate spray or a minimum of 100 gallons for dilute spray. Apply by air in a minimum of 10 gallons/acre. Begin applications drift precautions on this label. Do not apply more than 0.20 lb active ingredient/acre/season. Do not make applications less than 14 days apart.

**Oct. 15-Nov. 15: All Citrus****Table 28. Spider mites, rust mites**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Vendex 50WP (Fenbutatin-oxide)	2-3 pounds	8-12 ounces	1-1½ teaspoons	Performance of Vendex is reduced when daily temperatures at application average below 70 F. See preceding remarks for additional restrictions.

**Table 29. Rust mites**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Sulfur	See label.	See label.	See label.	Sulfur: Apply postharvest only if supplemental rust mite control is needed. See preceding remarks for oil and temperature restrictions.
Agri-mek 0.15EC (Abamectin)	5-20 fluid ounces	1¼ -5 ounces	¼ teaspoon	See details above.

**Table 30. Asian citrus psyllid**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Sevin XLR (Carbaryl)	1.5 quarts	See label.	See label.	PHI = 5 days; do not apply more than 20 quarts/acre/crop.

**Table 31. Leafminers**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
SpinTor 2SC (Spinosad)	6 fluid ounces	See label.	See label.	Follow label.
Admire Pro (Imidacloprid)	3.5-7.0 fluid ounces	See label.	See label.	

**Table 32. Fire ants**

Pesticide and Formulation	Rate of Product per Acre	Amount To Use for 100 Gallons	Amount To Use for 1 Gallon	Remarks
Extinguish IGR (Methoprene)	1-1½ pounds/acre	3-5 tablespoons/mound	See label.	Follow label.

**Note:** Add a spreader sticker or liquid soap to spray the mixture to obtain better coverage especially when emulsifiable concentrates are used. If rust mite control is poor, reduce speed or increase gallonage/acre if using a speed sprayer.

**Mite-Resistance Management Plan:** Repeated use of the same miticide is documented to result in a rapid buildup of miticide-resistant strains of mites. To reduce the potential risk of developing resistant mite populations, miticides should be alternated as part of a mite-resistance management plan. If more than one application is needed to control heavy and prolonged mite infestations, always alternate products with a different mode of action. Observe the minimum required spray intervals and restrictions on the amount of product and number of applications/area/seasons. Closely monitor mite populations to determine species, infestation levels, and the presence of predatory organisms. Use miticide sprays only when needed.

**Caution:** Oil emulsion sprays should not be applied to drought-stricken trees when the temperature is above 85 F and humidity less. Oil emulsion sprays applied after Aug. 15 may inhibit solid formation, retard coloring of fruit, and reduce the tolerance of trees to cold. Follow specific instructions on the label of all pesticides.

**Warning:** Always wear appropriate personal protective equipment when handling and spraying pesticides.

Re-entry times for workers entering groves and/or treated fields should be strictly observed; be sure to check the label for this information.

## Diaprepes Root Weevil Management Recommendation

Treat every life stage (egg, larva, adult) with at least one treatment each year. Continue treatment until Diaprepes root weevils are not found for a full year. All adult treatments should be applied in 100-300 GPA water to ensure good coverage of insecticide (unless otherwise directed by the label). Be sure to read and follow all insecticide label instructions. Remember: the label is the law!

### Timing of Adult Sprays:

- First spray during peak summer flush – usually late May (scout for adults beginning in April).
- Second spray four weeks later, combined with Micromite 80SG with oil for egg sterilization – usually late June (timing will vary depending on adult emergence).

**Chemical Barrier for Larval Suppression:**

- Target is larvae that will burrow into the soil after hatching from eggs deposited on leaves.
- Apply about two weeks after peak adult emergence – typically late July.
- Must be applied to soil that is mostly free of vegetation.
- Uniformly apply from the trunk to the dripline of the tree to a moistened soil surface devoid of litter.
- Minimize disturbance of soil beneath the tree to maintain the barrier.
- Brigade should provide about three weeks of activity.

**Table 33. Diaprepes Root Weevil**

Insecticide	Target	Method of Application	Rate Per Acre	Comments
Micromite 80SG (Diflubenzuron)	Diaprepes root weevil egg	Apply to vegetation.	6.25 ounces + 0.5% oil	Apply when adults are actively depositing eggs. Helps prevent egg hatch (oranges, grapefruit, and tangerines).
Admire Pro 4F (Imidacloprid)	Diaprepes root weevil larva	Irrig sys or apply to pre-wet soil.	14 fluid ounces	Apply when root growth is occurring. Apply to soil; remains effective for up to 4-5 months.
Brigade WSB (Bifenthrin)	Diaprepes root weevil Adult/Larva	Soil barrier	40 ounces	Apply twice per year to coincide with adult emergence. Do not exceed 80 ounce/year. Will control larvae when they burrow into the soil. Will also control adults when they emerge from the soil. Must be applied to soil that is relatively free of debris and vegetation. Avoid disturbing the soil surface after application.
Baythroid 2E (Cyfluthrin)	Diaprepes root weevil Adult	Apply to vegetation.	6.4 ounces	Only a single application may be made per crop season.
Danitol 2.4EC (Fenpropathrin)	Diaprepes root weevil Adult	Apply to vegetation.	16-21 ounces	Citrus trees must be 3 years or older. Do not exceed 21.33 fluid ounces/year.
Kryocide 96 WP or Prokil Cryolite 96 (Cryolite)	Diaprepes root weevil Adult	Apply to vegetation.	8-10 pounds	This slow-acting stomach poison may take several days of warm weather to kill beetles. Do not exceed 90 pounds/acre/season.

Insecticide	Target	Method of Application	Rate Per Acre	Comments
Mustang (Zeta-cypermethrin)	Diaprepes root weevil Adult	Apply to vegetation.	4.3 fluid ounces	Apply by ground equipment using sufficient water to obtain full coverage of foliage in a minimum of 20 gallons for concentrate spray or a minimum of 100 gallons for dilute spray. Apply by air in a minimum of 10 gallons per acre. Begin applications when pest activity is noted. Follow appropriate spray drift precautions.
Orthene 97* <sup>1</sup> (Acephate)	Diaprepes root weevil Adult	Apply to vegetation.	0.5 – 0.75 pound	Apply at 100 gallons water/acre or less.
Sevin 80S <sup>1</sup> (Carbaryl)	Diaprepes root weevil Adult	Apply to vegetation.	5-10 pounds + 0.5% oil	Do not apply during bloom. Do not exceed 25 pounds/acre/ application.
Sevin XLR Plus <sup>1</sup> (Carbaryl)	Diaprepes root weevil Adult	Apply to vegetation.	6 quarts + 0.5% oil	During bloom period, apply from 1 hour after sunset until 2 hours after sunrise.
Micromite 80SG (Diflubenzuron)	Diaprepes root weevil egg	Apply to vegetation.	6.25 ounces + 0.5% oil	Apply when adults are actively depositing eggs. Helps prevent egg hatch (oranges, grapefruit and tangerines).

\*Nonbearing citrus only

<sup>1</sup> Be sure to adjust water pH into the range of 5.5 to 6.5.

## Fig Spray Schedule

### Table 1. Vinegar flies

Material	Rate	Restrictions
Malathion 57 EC (Malathion)	2 quarts plus 1-2 gallons unsulfurized molasses/acre	PHI=3 days; use 300 gallons water/acre. Sanitation: Early harvest and complete fruit removal at harvesting will reduce fruit exposure to flies. Disc under affected hosts to destroy fermented fruit residues.

### Table 2. Fig scale

Material	Rate	Restrictions
Volk supreme oil	3 gallons/100 gallons water	Dormant or delayed dormant spray only.

### Table 3. Spider mites

Material	Rate	Restrictions
Omite 30WP (Propargite)	6 pounds/acre Two applications	Use only on nonbearing trees and when trees will not bear fruits within 1 year of application.
Omite 6E (Propargite)	2 pints/acre Two applications	Follow label.
Volk supreme oil	3 gallons/100 gallons water	Dormant or delayed dormant spray only.
Sulfur	Follow labeled rate.	Do not mix with oils and/or do not apply within 3 weeks of oil applications to avoid fruit burn. Some sulfur formulations should not be combined with spreader stickers. Sulfur may cause eye and skin irritation. Avoid when hot temperatures (above 90 F) are expected within three days of spraying.

**Warning:** Re-entry time for workers entering treated areas should be strictly observed. Read the label for this information.



## Mayhaw Spray Schedule

**Table 1. Aphids (except wooly apple aphid)**

Material	Rate	Restrictions
Admire Pro 4F (Imidacloprid)	2.8 fluid ounces/per acre	PHI=7 days; apply postbloom; highly toxic to bees.
Mustang Maxx (Zeta-cyprmethrin)	0.21-0.32 fluid ounce/50 gallons or 1.28 fluid ounces/acre	PHI=14 days; allow 7 days between applications.

**Table 2. Leafminers**

Material	Rate	Restrictions
SpinTor 2SC (Spinosad)	1.0-2.5 fluid ounces/100 gallons or 4.0-10.0 fluid ounces/acre	PHI=7 days; do not apply more than 29 fluid ounces/acre/year.

**Table 3. Leafhoppers**

Material	Rate	Restrictions
Admire Pro 4F (Imidacloprid)	1.4-2.8 fluid ounces/per acre	PHI=7 days; apply post-bloom; highly toxic to bees.
Mustang Maxx (Zeta-cyprmethrin)	0.21-0.32 fluid ounce/50 gallons or 1.28 fluid ounces/acre	PHI=14 days; allow 7 days between applications.

**Table 4. Aphids, plum curculio**

Material	Rate	Restrictions
Actara (Thiamethoxam)	4.5 ounces/acre	PHI=35 days; highly toxic to bees; do not make more than 1 prebloom application.
Mustang Maxx (Zeta-cyprmethrin)	0.21-0.32 fluid ounce/50 gallons or 1.28 fluid ounces/acre	PHI=14 days; allow 7 days between applications.

**Table 5. Spider mites**

Material	Rate	Restrictions
Savey 50DF (Hexythiazox)	3.0-6.0 ounces/acre	PHI=28 days; apply at the beginning of mite infestations. Savey is not effective against adult mites. Limit to 1 application/year. Do not use in home plantings.

**Warning:** Re-entry time for workers entering treated areas should be strictly observed. Read the label for this information.

## Peaches Spray Schedule

### Dormant

**Table 1. Dormant**

Insect	Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Scales, if present	Oil emulsion, 3% actual oil in diluted spray (follow recommendations of manufacturer).	See label.	Two sprays must be conducted at least 1 week and no more than 10 days apart to be effective. Be sure to cover underside of scaffold with pressure and not from run-off.
Severe scale infestations	Lorsban 4E (Chlorpyrifos)	0.5-1.0 pint	Only 1 application of Lorsban per dormant season (and one postharvest for borer control). Do not apply after delayed dormant stage. Not allowed for in-season use. Use a minimum of 1.5 pints/acre.
	Esteem 35WP (Pyriproxyfen)	4.0-5.0 ounce/acre + 1.5 gallons oil	PHI=14 days; use highest labeled rate under heavy infestations. Limit to 3 Esteem applications per season. Allow 14 days between treatments. Sprays must be timed to coincide with crawler emergence.  Pyrethroids such as Ambush, Asana, Proaxis and Pounce are often associated with scale outbreaks.

### Pink bud to bloom

**Table 2. Catfacing insects (stink bugs, leaf-footed bugs) (at pink to 10% bloom)**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Proaxis (Gamma-cyhalothrin)	0.427-0.853 fluid ounce	Do not apply more than 0.1 lb AI/acre/season; PHI=21 days.
Mustang Max (Zeta-cypermethrin)	0.43-1.3 fluid ounce	Apply as required by scouting. Allow a minimum of 7 days between applications; PHI=14 days.

**Petal fall (when 75% of petals have fallen)****Table 3. Curculio**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Imidan 70W (Phosmet)	3/4-1.0 pound	PHI=14 days; do not apply more than 16lb./acre/season.
Ambush 25W (Permethrin)	1.6-4.8 ounces	Use higher rate for curculio control. PHI=14 days; Ambush not to exceed 400 gallons/acre/application.
Mustang Max (Zeta-cypermethrin)	0.43-1.3 fluid ounces	Apply as required by scouting. Allow a minimum of 7 days between applications; PHI-14 days.
Proaxis (Gamma-cyhalothrin)	0.427-0.853 fluid ounce	Do not apply more than 0.1 pound/ A/acre/season; PHI=14 days.

**Table 4. Catfacing insects (aphids, stinkbugs, leaf-footed bugs)**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Lannate LV (Methomyl)	3/4 pint	PHI=4 days; Highly toxic material; use with caution. Lannate may promote mite infestation. Not for use to control scales.
Lannate SP (Methomyl)	1/4 pound	Follow label
Pounce 3.2 EC (Permethrin)	2.0-6.0 ounces	Pyrethroids such as Ambush, Asana, Mustang Max, Proaxis and Pounce are often associated with scale insect outbreaks.
Proaxis (Gamma-cyhalothrin)	0.427-0.853 fluid ounce	Follow label.
Mustang Max (Zeta-cypermethrin)	0.43-1.3 fluid ounce	Follow label.

**Shuck split or first cover (10-12 days later)****Table 5. Curculio, catfacing insects, aphids, scales**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Same as petal fall	See label.	See above.

**Second cover (10-12 days later)****Table 6. Curculio**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Imidan 70W (Phosmet)	3/4-1.0 pound	PHI=14 days. See above for remarks.

**Table 7. Catfacing insects (stinkbugs, leaf-footed bugs)**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Ambush 25W (Permethrin)	1.6-4.8 ounces	PHI=14 days; See remarks above.
Pounce 3.2 EC (Permethrin)	2.0-6.0 ounces	Follow label
Proaxis (Gamma-cyhalothrin)	0.427-0.853 fl. ounce	Do not apply more than 0.1 lb AI/acre/season; PHI=21 days.
Mustang Maxx (Zeta-cypermethrin)	0.43-1.3 fl. ounce	Apply as required by scouting. Allow a minimum of 7 days between applications; PHI=14 days.
Lannate LV (Methomyl)	3/4 pint	PHI=4 days; see notes above for additional remarks.
Lannate SP (Methomyl)	1/4 pound	Follow label.

**Third cover (12-15 days later)****Table 8. Curculio, catfacing insects, scales**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Same as second cover spray. (It is recommended to rotate the mode of action).	See label.	See above for additional remarks.

**Fourth cover (14-21 days later)****Table 9. Curculio, catfacing insects, scales**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Same as third cover spray. (It is recommended to rotate the mode of action).	See label.	See above for additional remarks.

**Fifth cover (one month prior to harvest)****Table 10. Oriental moth, curculio**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Sevin 80S (Carbaryl)	0.63-0.94 pounds (= 2½-3¾ pounds/acre)	PHI=3 days; Carbaryl is highly toxic to bees. It tends to increase scales and sometimes mite problems.

**Table 11. Catfacing insects (stinkbugs, leaf-footed bugs)**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Imidan 70W (Phosmet)	¾-1.0 pound	PHI=14 days; see notes above.
Proaxis (Gamma-cyhalothrin)	0.427-0.853 fluid ounce	Do not apply more than 0.1 lb AI/acre/season; PHI=21 days.
Mustang Maxx (Zeta-cypermethrin)	0.43-1.3 fluid ounce	Apply as required by scouting. Allow a minimum of 7 days between applications; PHI=14 days.

**Table 12. Oriental moth, catfacing insects**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Lannate LV (Methomyl)	¾ pint	PHI=4 days; see notes above for additional remarks and cautionary statement.

**Table 13. Mites**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Savey 50F (Hexythiazox)	3.0-6.0 ounces/acre	PHI=28 days; limit to 1 application per season. Apply during early infestations. Savey is not effective against adult mite populations.

**3 weeks prior to harvest****Table 14. Oriental moth, curculio**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Imidan 70W (Phosmet)	3/4-1.0 pound	PHI=14 days; see notes above.
Proaxis (Gamma-cyhalothrin)	0.427-0.853 fluid ounce	Do not apply more than 0.1 lb AI/acre/season; PHI=21 days.
Mustang Maxx (Zeta-cypermethrin)	0.43-1.3 fluid ounce	Apply as required by scouting. Allow a minimum of 7 days between applications; PHI=14 days.

**Table 15. Oriental moth**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Malathion 57EC (Malathion)	2 pints/acre	PHI=7 days.
Proaxis (Gamma-cyhalothrin)	0.427-0.853 fluid ounce	Do not apply more than 0.1 lb AI/acre/season; PHI=21 days.
Mustang Maxx (Zeta-cypermethrin)	0.43-1.3 fluid ounce	Apply as required by scouting. Allow a minimum of 7 days between applications; PHI=14 days.

**Table 16. Catfacing insects (stinkbugs, leaf-footed bugs)**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Sevin 80S (Carbaryl)	0.63-0.94 pound (= 2½-3¾ pounds/acre)	PHI=3 days; Carbaryl is highly toxic to bees. See notes above.
Lannate LV (Methomyl)	3/4 pint	PHI=4 days; see notes above.
Proaxis (Gamma-cyhalothrin)	0.427-0.853 fluid ounce	PHI=21 days; see notes above.
Mustang Maxx (Zeta-cypermethrin)	0.43-1.3 fluid ounce	PHI=14 days; see notes above.

**Table 17. Mites**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Vendex 50 WP (Fenbutatin-oxide)	4.0-8.0 ounces	PHI=14 days; limit to 2 applications/season. Do not apply more than 3 pounds/acre/year.

## 2 weeks prior to harvest

**Table 18. Catfacing insects (stinkbugs, leaf-footed bugs)**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Lannate LV (Methomyl)	3/4 pint	PHI=4 days; see notes above.
Mustang Maxx (Zeta-cypermethrin)	0.43-1.3 fluid ounce	PHI=14 days; see notes above.

## Table 19. Oriental moth

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Malathion 57% EC (Malathion)	2 pints/acre	PHI=7 days.
Mustang Maxx (Zeta-cypermethrin)	0.43-1.3 fluid ounce	PHI=14 days; see notes above.

## Table 20. Curculio

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Sevin 80S (Carbaryl)	0.63-0.94 pound (= 2½-3¾ pounds/acre)	PHI=3 days; Carbaryl is highly toxic to bees. See notes above.
Mustang Maxx (Zeta-cypermethrin)	0.43-1.3 fluid ounce	PHI=14 days; see notes above.

## 1 week prior to harvest

**Table 21. Catfacing insects (stinkbugs, leaf-footed bugs)**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Sevin 80S (Carbaryl)	0.63-0.94 pounds (= 2½-3¾ pounds/acre)	PHI=3 days; Carbaryl is highly toxic to bees. See notes above.
Lannate LV (Methomyl)	3/4 pint	PHI=4 days; see notes above.

**Table 22. Mites**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Nexter (Pyridaben)	See label.	Refer to label for rate for specific species of mites. PHI=7 days; toxic to aquatic organisms; highly toxic to bees. Follow label.

**Postharvest trees****Table 23. Scales, leafhoppers, shot hole borers**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Lorsban 4E (Chlorpyrifos)	1/2-1.0 pint	Use as dormant or delayed dormant spray. Limit to 1 application during dormant or delayed dormant (and one postharvest for borer control). Do not use more than 4 pints/acre. As many as three or more generations of scales may occur after harvest. Any of the regular spray materials may be used to alternate during postharvest at the rates used during the season.

**April/October****Table 24. Fire ants**

Material/Insecticide	Amounts in 100 Gallons of Spray	Minimum Number of Days Before Harvest and Comments
Extinguish IGR (Methoprene)	1-1 1/2 pounds/acre	Apply broadcast over orchard floor in April when ants are actively foraging and prior to cold weather in October. Do not allow contact with fruit. Methoprene (A.I. for Extinguish) is an Insect Growth Regulator and therefore is slow acting. Ant population reductions may be observed 3-4 weeks after initial treatment. Apply on dry soil. Follow label for optimal results.



## Trunk Sprays for Peach Tree and Lesser Peach Tree Borer

The thoroughness of coverage is essential for borer control. It is suggested that all growers adopt the practice of spraying the trunk and scaffold limbs each time they spray. This practice will help control the few peach tree borers that emerge early in the season and particularly the lesser peach tree borer.

*Effective control of the peach tree borer has been obtained by spraying trunks with Lorsban as listed below.*

**Table 25. Trunk sprays tree borer**

Material	Formulation	Amount/100 Gallons	Time Of Application	Remarks
Lorsban (Chlorpyrifos)	4E	3.0 quarts	Recommended for postharvest use only. Apply as soon after harvest as possible. Use 0.75-1.0 quart of mixture on small trees and 1.5 quarts on larger trees. Best results are obtained closer to peak emergence, between Aug. 2 and Sept. 1. Application may be made early from mid-July on nonbearing trees.	<ul style="list-style-type: none"> <li>• Apply as a directed, handgun application to lower scaffolds, base and trunk.</li> <li>• Postharvest use only; limit to 1 application per season; toxic to fish. Do not use Lorsban on home plantings.</li> </ul>
Lorsban (Chlorpyrifos)	4E	1.5 quarts	This rate should be used only when new plantings are being sprayed or low populations of borers exist.	

## Peach Insect Pests

**Table 26.**

Insect	General Description/Remarks
<b>Armored scale</b>	San Jose scale has an ashy-gray appearance, is slightly convex, and is about the size of a pinhead. White peach scale spreads very rapidly and is distinguished by a cottony mass that is formed over the infested areas. The entire trunk and main branches will be white in a very short time. Common privet is a wild host for the white peach scale which makes this scale abundant all year. The host list is unlimited. Dormant sprays of Lorsban or Esteem plus oil should be used during the dormant season for heavy infestations and once for light infestations. Each season has several generations. It is imperative that each generation be controlled. Several generations occur after harvest, and it is imperative that scale insects be controlled if the trees are to survive.
<b>Soft scale</b>	The terrapin scale is a soft scale about the size of a pencil eraser. The young hatchings settle on the foliage and remain there until the third instar when they migrate back to the stems to mature and overwinter. The regular spray schedule will control these pests if enough water is used to get proper coverage. They are easiest to control when on the foliage. Oil sprays are ineffective on this scale.
<b>White peach scale and West Indian peach scale</b>	White peach attacks the entire tree and can kill trees if uncontrolled. During the growing season, a regular spray program will help to maintain this pest under control. Dormant sprays in the fall or prior to bud break may be applied in commercial production. Two sprays should be applied at 10- to 14-day intervals. COMPLETE COVERAGE IS ESSENTIAL.

Insect	General Description/Remarks
<b>Twig borers</b>	Two types of caterpillars infest peaches: the larvae of the Oriental fruit moth and the peach twig borer. The larvae of the Oriental fruit moth infest both the young twigs and fruits and breed throughout the warm season of the year. The peach twig borer attacks the young growing twigs early in the season soon disappearing.
<b>Plum curculio</b>	<p>The plum curculio is a white legless grub that infests the fruits only. The adult is a brownish weevil about 3/16 inches long. It has two generations a year. The first generation is out about bloom. Those that infest the peaches cause the growing fruit to drop. The second generation occurs some 40 to 50 days later.</p> <p><b>Damage:</b> The curculio causes the fruit to drop during 2 periods, soon after the young fruit sets and just prior to ripening. The first drop is caused by punctures made and worms hatching from eggs laid by overwintered weevils and the second by worms or grubs of the second generation.</p> <p><b>Sanitation:</b> The drops should be picked up twice each week during these 2 periods and destroyed. Picking up and destroying first drops is most important and if thoroughly done will aid materially in ensuring a crop that will be nearly free of worms at harvest time, providing there are no other nearby sources of infestation. Native plums are the most common and important of such sources. Therefore, native plum thickets should be destroyed or fenced in and hogged during the dropping periods. Also, volunteer peach and plum trees should be destroyed or treated along with the producing orchard.</p> <p><b>Pruning:</b> At pruning time, pull and burn all old mummies that carry the brown rot organism over the winter. Also, during the winter, clean and burn weeds and other debris in all areas in and around the orchard such as fence rows, ditch banks, etc. where the adult curculio and other pests may hibernate. These precautions aid in reducing infestations the following season.</p> <p><b>Note:</b> Where chewing or sucking insects are a potential problem, sprays should be made when buds are in the pink stage. Do not apply during blossoming. The effectiveness of the cover sprays may be improved by the addition of a spreader sticker. One should certainly be used when this schedule is followed with plums and nectarines.</p>
<b>Peach tree borer and lesser peach tree borer</b>	Borer tunneling is particularly injurious to young trees. Lesser peach tree borer (LPTB) adults lay eggs from spring to early winter. Most egg-laying from the peach tree borer (PTB) occurs from mid-June to early September. The peach tree borer attacks the crown area of the roots of peach, plum, and related trees. Borer infestations can be detected by the presence of frass and pupal cases protruding from the ground near the trunk (PTB) or scaffold limbs (LPTB). Initiate sprays soon after harvest. Use a hand-gun spray directed to lower scaffolds, vase, and trunk. Direct the spray at the trunk from the crotch at the scaffold limbs to the soil line. Completely wet the trunk and spray enough solution to wet or slightly puddle the spray at the base of the tree. It is essential that the trunk and soil area are wet all around the tree. Older trees may benefit from thorough coverage as some LPTB infestation concentrate in areas where primary scaffolds split.
<b>Rusty brown plum aphid</b>	The rusty brown plum aphid is present each year doing more or less damage to the foliage of plum and young peach trees shortly after they put out leaves. New foliage that is attacked becomes distorted and crumpled. Heavy infestations may injure the terminal buds that will stop growth, kill the blossoms and prevent fruit from setting.
<b>Plant bugs</b>	Several species of plant bugs injure peaches. These include the leaf-footed bug, several species of stinkbugs, and the tarnished plant bug. These insects pierce the green peaches with their beaks and then suck the sap for food. Young peaches, especially those punctured by the larger bugs, may drop. Otherwise, the peaches are usually misshaped, knotty, or catfaced. This damage renders the fruit unmarketable. These insects are usually worse following winter cover crops, and the damage is done when the peaches are small. Plant bugs may also be pests after harvest by feeding on young terminals. This injury or flagging of terminals may appear to be an Oriental fruit moth. If stems are dry and not hollowed out, the damage is from plant bugs.
<b>Shot hole borer</b>	The shot hole borer is a small beetle that attacks peach and related trees boring numerous small holes in the trunks and limbs. Its attack is confined largely to trees that are dying or in low vitality due to attacks of insects, diseases, or other causes. The control and prevention consist of removing all dying trees, pruning infested limbs of other trees, and burning. The control of other insects and diseases, fertilization, and cultivation keep the trees healthy and vigorous. Without proper management of potential habitats for these beetles, they can seriously affect leaf and fruit buds. These beetles overwinter in all forms. If weather conditions are favorable, they can emerge in January or February. At this time, they have only the buds to feed on and they can eat every bud of available trees.

## Pear Spray Schedule

**Table 1.**

Name and Time of Spray	Insect	Materials/ Insecticide	To Make 50 Gallons of Spray	Precautions
<b>Dormant: December or January</b>	San Jose scale	Oil Emulsion, 3% actual oil in diluted spray	Follow manufacturer's recommendation for mixing.	No time limit.
		Admire Pro 4F (Imidacloprid)	2.8 fluid ounces/per acre	PHI=7 days; toxic to bees; allow 10 days between applications. Max=45 fluid ounces/ per acre/per season.
		Esteem (Pyriproxyfen)	13.0-16.0 fluid ounces/acre + oil	PHI=45 days; limit to 2 applications per season. Allow 14 days between Esteem sprays. Complete coverage is essential for control.
<b>Calyx – apply when petal fall is 80%</b>	Catfacing Insects, Leafrollers, Scales	SpinTor 2SC (Spinosad)	0.62-1.25 fluid ounces/50 gallons	PHI=7 days; toxic to aquatic invertebrates; toxic to bees exposed to treatment within 3 hours of spray; not labeled to control scales.
	Leafhoppers, Eastern Tent Caterpillars	Carbaryl (Sevin)	0.5 pound, 50% WP	PHI=3 days; extremely toxic to aquatic invertebrates; highly toxic to bees.
	Leafhoppers	Imidan 70W (Phosmet)	0.5-1.34 pounds A.I./50 gallons	PHI=7 days; do not use Imidan on homegrown trees; extremely toxic to fish; highly toxic to bees.
		Admire Pro 4F (Imidacloprid)	1.4-2.8 fluid ounces/per acre	PHI=7 days; toxic to bees; allow 10 days between applications. Max=45 fluid ounces/per acre/per season.
		Proaxis (Gamma-cyhalothrin)	0.427-0.853 fluid ounce	PHI=21 days; do not apply more than 0.1 lb A.I./acre/season.
		Mustang Maxx (z-cypermethrin)	0.21-0.32 fluid ounce/50 gallons	PHI=14 days; allow 7 days between applications.
<b>Apply in mid- April or when leaves start unfolding</b>	Catfacing Insects, Leafrollers, Scales	Same as above. <i>Except do not use Proaxis or Mustang Maxx for scales.</i>	Same as above.	Same as above.
	Eastern Tent Caterpillars, Leafhoppers	Actara (Thiamethoxam)	2.0-2.75 ounces/acre	PHI=14 days; (or 35 days PHI if rates higher than 2.75 ounces/acre are used); allow 10 days between applications; highly toxic to bees. Follow label.
	Mites: European Red Mite, Two-spotted Mite	Savey 50DF (Hexythiazox)	3.0-6.0 ounces/acre	PHI=28 days; limit to 1 application/year. Make applications when mite populations first appear.

Name and Time of Spray	Insect	Materials/ Insecticide	To Make 50 Gallons of Spray	Precautions
<b>Apply in mid-May</b>	Catfacing Insects, Leafrollers, Scales, Leafhoppers, Eastern Tent Caterpillars	Same as above.	Same as above.	Same as above.
	Mites: European Red Mite, Two-spotted Mite, Pear Rust Mite	Vendex 50WF (Fenbutatin-oxide)	1.0-2.0 pounds/acre	PHI=14 days; efficacy of Vendex is reduced at temperatures below 70 F. Limit to 2 applications/season. Make applications when mite populations first appear.
<b>Mid-May to harvest</b>	Catfacing Insects, Leafrollers, Scales, Leafhoppers, Eastern Tent Caterpillars	Same as above.	Same as above.	Same as above. See limitations of preharvest intervals. Follow label.

## Pecan Spray Schedule

Control of insects is essential for profitable pecan production in Louisiana. Commercial pecan producers must be equipped to spray at the proper time with the recommended insecticides. Knowing how to identify the major insect pests of pecans during the growing season is important in determining if an insecticide application is needed and, if so, when it should be applied.

Many generic insecticides are now available. Carefully read the label to make sure the correct active ingredient is being used for the insects or mites being controlled.

When using pesticides, it is very important that they be applied only when needed. The correct insecticide should be used for a given pest, and it should be applied at the correct rate. The pH of the water being used for spraying should be between 5.5 to 6.5 to ensure the optimal efficacy of the insecticide. If the pH of the water does not fall within this range, a buffering agent to adjust should be used to adjust the pH accordingly. The use of a buffering agent will help to maintain the desired pH once insecticides have been added to a solution.

Be sure to follow the directions on the label of the insecticide being used. In addition to what the insecticide can control and the rates to use, the label will provide additional information regarding the use of spray adjuvants, re-entry times following treatment applications, harvest intervals, grazing restrictions, product safety information, and worker protection information.

**Table 1. Spray Guide for Control of Pecan Insects and Mite Pests**

Insect	Time of Application	Suggested Insecticides and Rates*
Scale insects	Late February until buds first begin to break.	3 gallons of dormant oil/acre. If trees are weak use only 2 gallons/acre.
Pecan phylloxera	Between the time the buds begin to open and approximately $\frac{1}{2}$ - $\frac{3}{4}$ inch of new growth begins to appear; use a hand lens or magnifying glass to make sure phylloxera are present. Treat only those trees previously infested and those adjacent to them. If infestation levels are high, 2 insecticide applications may be needed.	Lorsban 4E (chlorpyrifos): .5-2.0 pints/acre Provado 1.6F (imidacloprid): 3.5-7.0 fl. ounces/acre Warrior (lambda-cyhalothrin): 2.56-5.12 fl. ounces/acre Warrior II (lambda-cyhalothrin): 1.28-2.56 fl. ounces/acre Centric 40WG (thiamethoxam): 2.0-2.5 fl. ounces/acre Proaxis (gamma-cyhalothrin): 2.56-5.12 fl. ounces/acre Fulfill (pymetrozine): 4.0 fl. ounces/acre Endigo ZC (lambda-cyhalothrin + thiamethoxam): 5.0-6.0 fl. ounces/acre Admire Pro(imidacloprid, foliar application): 1.2-2.4 fl. ounces/acre Movento (spirotetramat): 6.0-9.0 fl. ounces/acre

Insect	Time of Application	Suggested Insecticides and Rates*
<p><b>Pecan nut casebearer</b></p>	<p>Begin scouting for casebearer eggs on May 1. If pheromone traps are used to monitor adult activity, they should be in place by the third week of April. Once adults are observed in the traps begin inspecting nut clusters for egg lay. Insecticide applications should be made when egg lay is observed on 1%-3% of the nut clusters. A second application may be necessary if infestation levels are high or emergence and egg lay are prolonged. Continue monitoring adult activity and egg lay after the initial insecticide application to determine if a second application is necessary.</p>	<p>Imidan 70W (phosmet): 2.0-3.0 pounds/acre                      Confirm 2F (tebufenozide): 8.0-16.0 fl. ounces/acre                      Intrepid 2F (methoxyfenozide): 4.0-8.0 fl. ounces/acre                      Spintor 2SC (spinosad): 4.0-10.0 fl. ounces/acre                      Warrior (lambda-cyhalothrin): 2.56-5.12 fl. ounces/acre                      Warrior II (lambda-cyhalothrin): 1.28-2.56 fl. ounces/acre                      Dimilin 2L (diflubenzuron): 8.0-16.0 fl. ounces /acre                      Ammo 2.5EC (cypermethrin): 3.0-5.0 fl. ounces /acre                      Entrust (spinosad): 1.25-3.0 ounces/acre**                      Mustang Maxx (zeta-cypermethrin): 3.2-4.0 fl. ounces /acre                      Proaxis (gamma-cyhalothrin): 2.56-5.12 fl. ounces /acre                      Altacor (chlorantraniliprole): 2.0-4.5 ounces/acre                      Endigo ZC (lambda-cyhalothrin + thiamethoxam): 5.0-6.0 fl. ounces/acre                      Voliam Xpress (lambda-cyhalothrin): 6.0-12.0 fl. ounce/acre                      Proclaim (emamectin benzoate): 3.2-4.8 fl. ounce/acre</p>
<p><b>Pecan spittlebug</b></p>	<p>Begin treatments when 5%-10% of nut-bearing terminals are infested. Apply treatments when spittle masses first appear.</p>	<p>Provado 1.6F (imidacloprid): 3.5-7.0 ounces/acre                      Imidan 70 WSB (phosmet): 1.0-1.5 pounds/acre                      Warrior (lambda-cyhalothrin): 2.56-5.12 fl. ounces/acre                      Warrior II (lambda-cyhalothrin): 1.28-2.56 fl. ounces/acre                      Proaxis (gamma-cyhalothrin): 2.56-5.12 fl. ounces/acre                      Voliam Xpress (lambda-cyhalothrin): 6.0-12.0 fl. ounces/acre                      Admire Pro (imidacloprid, foliar application): 1.2-2.4 fl. ounces/acre                      Endigo ZC (lambda-cyhalothrin + thiamethoxam): 5.0-6.0 fl. ounces/acre</p>
<p><b>Hickory shuckworm</b></p>	<p>Begin treatment applications at half-shell hardening (around August 10-15); 2-3 applications may be needed depending on the severity of the infestation. Insecticide applications should be made 10-14 days apart.</p>	<p>Confirm 2F (tebufenozide): 8.0-16.0 fl. ounces/acre                      Spintor 2SC (spinosad): 4.0-10.0 fl. ounces/acre                      Warrior (lambda-cyhalothrin): 2.56-5.12 fl. ounces/acre                      Warrior II (lambda-cyhalothrin): 1.28-2.56 fl. ounces/acre                      Intrepid 2F (methoxyfenozide): 4.0-8.0 fl. ounces/acre                      Mustang Maxx (zeta-cypermethrin): 3.2-4.0 fl. ounces/acre                      Proaxis (gamma-cyhalothrin): 2.56-5.12 fl. ounces /acre                      Dimilin 2L (diflubenzuron): 8.0-16.0 fl. ounces /acre                      Imidan 70WSB (phosmet): 2.0-3.0 pounds/acre                      Entrust (spinosad): 1.25-3.0 fl. ounces/acre                      Altacor (chlorantraniliprole): 2.0-4.5 ounces/acre                      Endigo ZC (lambda-cyhalothrin + thiamethoxam): 5.0-6.0 fl. ounces/acre                      Voliam Xpress (lambda-cyhalothrin): 6.0-12.0 fl. ounces/acre                      Proclaim (emamectin benzoate): 3.2-4.8 fl. ounces/acre                      Brigade WSB (bifenthrin): 8.0-32.0 fl. ounces/acre</p>

Insect	Time of Application	Suggested Insecticides and Rates*
<b>Pecan leaf scorch mite</b>	When leaf discoloration (light brown to bronze-colored blotches) begins to appear, use a hand lens or magnifying glass (at least 10X) to inspect the leaves for the presence of mites. Sample 10 compound leaves on 5-10 trees throughout the orchard. Treat when an average of 8 or more mites per compound leaf are found.	Vendex 50WP (fenbutin-oxide): 1.0-2.5 fl. ounces/acre Savey 50DF (hexythiazox): 3.0-6.0 fl. ounces/acre Portal (fenpyroximate): 32.0 fl. ounces/acre Epi-Mek (abamectin): 2.5-5.0 fl. ounces/acre Onager (hexythiazox): 12.0-24.0 fl. ounces/acre
<b>Yellow aphid</b>	Separate treatments for yellow aphids are generally not recommended. If a separate treatment is desired, treat when aphid numbers average 25-30 aphids per compound leaf. Do not treat yellow aphids before July 15. Sample 10 compound leaves on 5-10 trees throughout the orchard.	Provado 1.6 (imidacloprid): 3.5-7.0 fl. ounces/acre Ammo 2.5EC (cypermethrin): 3.0-5.0 fl. ounces/acre Mustang Maxx (zeta-cypermethrin): 3.2-4.0 fl. ounces/acre Warrior (lambda-cyhalothrin): 2.56-5.12 fl. ounces/acre Warrior II (lambda-cyhalothrin): 1.28-2.56 fl. ounces/acre Proaxis (gamma-cyhalothrin): 2.56-5.12 fl. ounces/acre Centric 40WB (thiamethoxam): 2.0-2.5 fl. ounces/acre Admire Pro ((imidicloprid, foliar application): 1.2-2.4 fl. ounces/acre Movento (spirotetramat): 6.0-9.0 fl. ounces/acre Endigo ZC (lambda-cyhalothrin+thiamethoxam): 5.0-6.0 fl. ounces/acre Assail 30SG (acetamiprid): 2.5-9.6 ounces/acre Fulfill (pymetrozine): 4.0 fl. ounces/acre Brigade WSB (bifenthrin): 8.0-32.0 fl. ounces/acre
<b>Black pecan aphid</b>	Treat when there is an average of one black aphid per compound leaf. Sample 10 leaves on 5-10 trees throughout the orchard.	Ammo 2.5EC (cypermethrin): 3.0-5.0 fl. ounces/acre Imidan 70WSB (phosmet): 2.0 pounds/acre Warrior (lambda-cyhalothrin): 2.56-5.12 fl. ounces/acre Warrior II (lambda-cyhalothrin): 1.28-2.56 fl. ounces/acre Mustang Maxx (zeta-cypermethrin): 3.2-4.0 fl. ounces/acre Proaxis (gamma-cyhalothrin): 2.56-5.12 fl. ounces/acre Centric 40WB (thiamethoxam): 2.5 fl. ounces/acre Fulfill (pymetrozine): 4.0 fl. ounces/acre Provado 1.6 (imidicloprid): 8.0 fl. ounces/acre Admire Pro ((imidicloprid, foliar application): 2.8 fl. ounces/acre Dimethoate 4E (dimethoate): 11.0 fl. ounces/acre Endigo ZC (lambda-cyhalothrin+thiamethoxam): 6.0 fl. ounces/acre Brigade WSB (bifenthrin): 8.0-32.0 fl. ounces/acre
<b>Pecan weevil</b>	Treatment applications should begin when nuts enter the dough stage (around Aug. 20), and adult weevils are present; 2 or 3 applications may be needed. Insecticide applications should be made at 7-10-day intervals. The first treatment should be made following rain because this loosens the soil allowing for weevil emergence.	Sevin 80S (carbaryl): 1.5-2.0 pounds/acre Sevin XLR Plus (carbaryl): 2.5 quarts/acre Mustang Maxx (zeta-cypermethrin): 3.2-4.0 fl. ounces/acre Proaxis (gamma-cyhalothrin): 2.56-5.12 fl. ounces/acre Imidan 70WSB (phosmet): 2.0-3.0 pounds/acre

Insect	Time of Application	Suggested Insecticides and Rates*
<p><b>Fall webworm</b></p>	<p>Normally, this insect is controlled when treating other insect pests within the orchard. The presence of an occasional colony generally does not warrant treatment. However, if a grower decides an insecticide application is needed, it should be made when colonies are first observed and the larvae are small. The larger the colony, the more difficult it becomes to reach the larvae within the webbing with the Insecticide.</p>	<p>Confirm 2F (tebufenozide): 8.0-16.0 fl. ounces/acre                      Intrepid 2F (methoxyfenozide): 4.0-8.0 fl. ounces/acre                      Spintor 2SC (spinosad): 4.0-10.0 fl. ounces/acre                      Javelin WG (Bacillus thuringiensis): 0.25-4.0 pounds/acre**                      DiPel FS (Bacillus thuringiensis): 1.0-4.0 pints/acre                      Sevin 80S (carbaryl): 2.5-6.25 pounds/acre                      Sevin XLR Plus (carbaryl): 2.0-5.0 quarts/acre                      Proclaim (emamectin benzoate): 3.2-4.8 ounces/acre</p>

\* Rates are expressed in the amount of material to use per acre. If a sprayer is calibrated to deliver 75 gallons per acre, you should add the amount of material listed to every 75 gallons of water. If your sprayer is calibrated to deliver 150 gallons of water per acre, you should add the suggested amount of insecticide to every 150 gallons.

\*\* Certified for use in organic orchards.

**Note:** When ground equipment is not available, or when inclement weather prevents the use of ground equipment, insecticides can be applied with aircraft. The rates listed are also the rates to use when applying insecticides by air. The amount of finished spray per acre will vary depending on the type of aircraft being used.

**Treatment decisions:** For information on the use of pheromone traps and a degree day model for making treatment decisions go to <http://pecan.ipmpipe.org>. Go to the toolbox and click on the section on insect monitoring and control.



## Small Fruit Spray Schedule (Grape, Blueberry, and Bramble)

### Grape

**Table 1. Dormant spray**

Insect	Spray Materials in 1 Gallon and Remarks
Scales	<b>Copper sulfate (bluestone)</b> – 6 teaspoons; apply after pruning; burn all pruned vines. Complete coverage is important for scale control. Do not use dormant oils after the buds start to open.
	<b>Superior oil 1%</b> – Follow manufacturer’s recommendations.

**Table 2. Just before bloom**

Insect	Spray Materials in 1 Gallon and Remarks
Grape berry moths, leaf-chewing insects	<b>Carbaryl 50WP (Sevin)</b> – 2 tablespoons/gal water. PHI=7 days; Carbaryl is highly toxic to bees. Read label.
	<b>Imidan 70W (Phosmet)</b> – 1½-2½ pounds/acre. PHI=14 days; do not use Imidan in home and gardens.

**Table 3. Postbloom sprays: just after bloom and later at 10- to 14-day intervals to harvest**

Insect	Spray Materials in 1 Gallon and Remarks
Citrus blackflies, citrus leafminers, citrus whiteflies	<b>Esteem 0.86EC (Pyriproxyfen)</b> – 10 fl. ounces/acre. Be sure to apply in sufficient water to ensure thorough coverage of tree. Apply before populations build; 1 day pre-harvest interval. Do not make more than 2 applications/season. Allow 21 days between applications.
European red mites, two-spotted mites	<b>Vendex 50WP (Fenbutatin-oxide)</b> – PHI=14 days; apply 1-2 pounds/acre when mites first appear. Limit to 2 applications/season; efficacy reduced at temperatures below 70 F.
Grape berry moths, leaf-chewing insects	<b>Carbaryl 50WP (Sevin)</b> – 2 tablespoons/gal water. PHI=7 days; Carbaryl is highly toxic to bees. Read label.
	<b>Imidan 70W (Phosmet)</b> – 1½-2½ pounds/acre. PHI=14 days; do not use Imidan in home and gardens.
Leafhoppers, mealybugs	<b>Admire Pro (Imidacloprid)</b> – 1.0-1.4 ounce/acre; no pre-harvest interval limitation. Allow 14 days between applications. Limit to 2.8 ounces/acre/year.

**Warning:** Re-entry times for workers entering groves and/or treated fields should be strictly observed. Be sure to check the label for this information.

## Blueberry

### Table 4. Dormant spray oil

Insect	Insecticide	Remarks
Scales	Esteem 0.86EC (Pyriproxyfen) – 16 ounces/acre + Oil – 1.5 gallons	PHI=7 days; limit to 2 applications/growing season. Allow 14 days between Esteem applications.
	Summer or Superior oil (2%-3% actual oil)	Follow manufacturer's directions when using or mixing oil. Thorough coverage is necessary when using any foliar product to control scale insects.

### Table 5. Petal fall and cover spray: 10-14 days apart

Insect	Insecticide	Remarks
Maggots, weevils	Carbaryl 50WP (Sevin) 3-4 pounds/100 gallons	PHI=7 days; highly toxic to bees. A diluted spray of 125-150 gallons/acre is recommended first application, 3 weeks before harvest. Repeat 10 days later if needed.
	Lannate SP (Methomyl) – ½ pound/acre	PHI=3 days; highly toxic to bees. Do not apply during bloom. Toxic to fish, aquatic invertebrates, and mammals. Limit to 4 applications/season. Use with care.
	Lannate (2.4) LV (Methomyl) – 1½ pints/acre	
Fruitworms	Esteem 0.86EC (Pyriproxyfen) – 16 ounces/acre	PHI=7 days; see preceding remarks; follow label.
Fruitworms (suppression)	SpinTor 2SC (Spinosad) – 4-6 fluid ounces/acre	PHI=3 days; see preceding remarks.
Fruitworms, maggots, weevils	Imidan 70W (Phosmet) – 1½ pounds/acre	PHI=3 days; do not make more than 5 applications/acre/year.
Maggots, weevils, maggots	Carbaryl 50WP (Sevin) 3-4 pounds/100 gallons	PHI=7 days; highly toxic to bees. A diluted spray of 125-150 gallons/acre is recommended first application, 3 weeks before harvest. Repeat 10 days later if needed.
	Lannate SP (Methomyl) – ½ pound/acre	PHI=3 days; highly toxic to bees. Do not apply during bloom. Toxic to fish, aquatic invertebrates, and mammals. Limit to 4 applications/season. Use with care.
	Lannate (2.4) LV (Methomyl) – 1½ pints/acre	

### Table 6. Postharvest

Insect	Insecticide	Remarks
Fire ants	Extinguish IGR (Methoprene) – 1.0-1.5 pounds/acre (Broadcast)	Apply in April when ants are actively foraging and in October prior to cool weather. Apply to dry soil.

**Bramble (Blackberry, etc.)****Table 7. Dormant**

Insect	Time of Application and Insecticide/Gallon	Remarks
Mites, scales	Summer or Superior oil	Follow the manufacturer's directions. Complete spray coverage is necessary.

**Table 8. Delayed dormant as buds begin to break**

Insect	Time of Application and Insecticide/Gallon	Remarks
Scales	Summer or Superior oil	Follow the manufacturer's directions. Complete spray coverage is necessary.

**Table 9. Prebloom just before blossoms open**

Insect	Time of Application and Insecticide/Gallon	Remarks
Aphids	Malathion 57EC (Malathion) – 3 pints/acre	PHI=1 day; highly toxic to bees. Do not apply at bloom or when bees may be exposed.
Leafhoppers, leafrollers, sawflies, thrips	Carbaryl 50W (Sevin) – 1 tablespoon	PHI=7 days; highly toxic to bees; do not apply at bloom or when bees may be exposed.
	SpinTor 2SC (Spinosad) – 4-6 fluid ounces/acre	SpinTor is toxic to bees exposed to treatment within 3 hours of spray; toxic to aquatic invertebrates. Rotate products after 2 continuous applications of SpinTor. Limit to 29 fl. ounces/acre/ season. Allow 3 days before harvest.
Leafrollers	Brigade WSB (Bifenthrin) – 8-16 ounces/acre	PHI=3 days; highly toxic to bees and extremely toxic to fish and aquatic invertebrates. May not be used if endangered species may get into contact with the treatment. Read label. Consult local agents.
Mites	Brigade WSB (Bifenthrin) – 16 ounces/acre	
Mites, thrips	Malathion 57EC (Malathion) – 1½ pints/100 gallons water	PHI=1 day; highly toxic to bees. Do not apply at bloom or when bees may be exposed.

**Table 10. After blossom to harvest**

Insect	Time of Application and Insecticide/Gallon	Remarks
Blackberry and raspberry crown borers, leafhoppers, mites, sawflies, thrips	Malathion 57EC (Malathion) – 1½ pints/100 gallons water	August-September: Ideal time for fall applications; PHI=1 day; highly toxic to bees. Do not apply at bloom or when bees may be exposed.

**Table 11. April/October**

Insect	Time of Application and Insecticide/Gallon	Remarks
Fire ants	Extinguish (Methoprene) – 1.0-1.5 pounds	Broadcast in April when ants are actively foraging and in October prior to cool weather. Apply on dry soil.

**Note:** Various borers cause problems in the canes. Infested or galled canes should be cut out and destroyed. Thorough spray coverage is important for any foliar product used. The volume of spray used should increase throughout the season.

## Strawberry Spray Guide

### Table 1. Aphids

Insecticide and Formulation	Rate/50 Gallons	Cutoff Date	Restrictions or Limitations
Admire Pro	1.3 fl. ounces/acre	7 days	Allow 5 days between applications. Toxic to bees; do not apply during bloom. Use a spreader sticker to improve coverage. Apply before heavy infestations get established. Limit 3.9 fluid ounces/acre per crop season.
Malathion 5 pounds EC	1.0-1½ pints	3 days	Toxic to fish and highly toxic to bees. Observe label. Do not use when cyclamen mites are a problem.
Malathion 25% WP	3 pounds	3 days	Toxic to fish and highly toxic to bees. Observe label. Do not use when cyclamen mites are a problem.

### Table 2. Armyworms

Insecticide and Formulation	Rate/50 Gallons	Cutoff Date	Restrictions or Limitations
Carbaryl 4L	1-2 quarts/acre	7 days	A dilute spray of 100-200 gallons/acre is suggested. Read label for susceptibility of some varieties; highly toxic to bees. Repeated use may cause spider mite problems.
SpinTor 2SC	4-6 fluid ounces/acre	1 day	SpinTor is toxic to bees exposed to treatment within three hours of spray; toxic to aquatic invertebrates. Rotate product after 2 continuous applications. Limit to 29 fl. ounces/ acre/season. See preceding remarks on SpinTor.

### Table 3. Fire Ants

Insecticide and Formulation	Rate/50 Gallons	Cutoff Date	Restrictions or Limitations
Extinguish IGR	1.0-1.5 pounds/ acre	See label.	Apply to row middles in April when ants are actively foraging and in October prior to cool weather. Do not allow contact with fruit. Do not use when soil is too wet.

### Table 4. Lygus bugs and leafhoppers

Insecticide and Formulation	Rate/50 Gallons	Cutoff Date	Restrictions or Limitations
Malathion 5 pounds EC	1.0-1½ pints	3 days	Toxic to fish and highly toxic to bees. Observe label. Do not use when cyclamen mites are a problem.
Malathion 25% WP	3 pounds	3 days	Toxic to fish and highly toxic to bees. Observe label. Do not use when cyclamen mites are a problem.

**Table 5. Lygus and tarnished plant bugs**

Insecticide and Formulation	Rate/50 Gallons	Cutoff Date	Restrictions or Limitations
Brigade WSB	24 fluid ounces/ acre (3 soluble bags)	0 days	Highly toxic to bees and extremely toxic to fish and aquatic invertebrates. May not be used if endangered species could get in contact with treatment. Read label. Consult local agents.
Danitol 2.4 EC	10 ⅔ fluid ounces/acre	2 days	Allow 30 days between treatments. Use only when mite populations are low. Add spreader sticker. Limit to 2 applications/year.

**Table 6. Snails and slugs**

Insecticide and Formulation	Rate/50 Gallons	Cutoff Date	Restrictions or Limitations
Metaldehyde bait	See label.	See label.	Apply to soil around plants. Do not contaminate edible parts. Toxic to dogs and cats.

**Table 7. Spittlebugs**

Insecticide and Formulation	Rate/50 Gallons	Cutoff Date	Restrictions or Limitations
Malathion 5 pounds EC	1.0-1.5 pints	3 days	Toxic to fish and highly toxic to bees. Observe label. Do not use when cyclamen mites are a problem.
Malathion 25% WP	2-4 pounds	3 days	Toxic to fish and highly toxic to bees. Observe label. Do not use when cyclamen mites are a problem.
Danitol 2.4EC	10 ⅔ fluid ounces/ acre	2 days	Allow 30 days between treatments. Use only when mite populations are low. Add spreader sticker. Limit to 2 applications/year
Carbaryl 80% S	1¼ pounds	7 days	A dilute spray of 100-200 gallons/acre is suggested. Read the label for susceptibility of some varieties; highly toxic to bees. Repeated use may cause spider mite problems.

**Table 8. Strawberry leaf rollers**

Insecticide and Formulation	Rate/50 Gallons	Cutoff Date	Restrictions or Limitations
Carbaryl 80% S	1¼ pounds	7 days	A dilute spray of 100-200 gallons/acre is suggested. Read the label for susceptibility of some varieties; highly toxic to bees. Repeated use may cause spider mite problems.
Malathion 5 pounds EC	1.0-1½ pints	3 days	Toxic to fish and highly toxic to bees. Observe label. Do not use it when cyclamen mites are a problem.
Malathion 25% WP	3 pounds	3 days	Toxic to fish and highly toxic to bees. Observe label. Do not use it when cyclamen mites are a problem.
SpinTor 2SC	4-6 fluid ounces/acre	1 day	SpinTor is toxic to bees exposed to treatment within three hours of spray; toxic to aquatic invertebrates. Rotate the product after 2 continuous applications. Limit to 29 fl. ounces/ acre/season.

**Table 9. Strawberry weevils**

Insecticide and Formulation	Rate/50 Gallons	Cutoff Date	Restrictions or Limitations
Carbaryl 80% S	1¼-2½ pounds/acre	7 days	A dilute spray of 100-200 gallons/acre is suggested. Read the label for susceptibility of some varieties; highly toxic to bees. Repeated use may cause spider mite problems.

**Table 10. Two-spotted mites**

Insecticide and Formulation	Rate/50 Gallons	Cutoff Date	Restrictions or Limitations
Acramite 50WS	0.75-1.0 pound/acre	1 day	Effective mite control is better accomplished when treatments are conducted when mites first appear before populations build up. Each bag contains two water-soluble bags of ½ pound each. Limit to 2 applications/season and a minimum of 21 days between applications.
Agri-Mek 0.15 EC	16 fluid ounces/acre	3 days	Do not apply more than 64 fl. ounces/acre. Do not apply within 3 days of harvest. Allow 21 days between treatments.
Danitol 2.4EC	16-21½ fluid ounces/acre	2 days	Allow 30 days between treatments. Use only when mite populations are low. Add spreader sticker. Limit to 2 applications/year.
Insecticidal soap (M-Pede)	1 gallon	0 days	Thorough coverage is needed.
Savey 50DF	6.0 fluid ounces/ acre	3 days	Limit to 1 application/year. Apply as soon as mites are detected. Savey is predominantly an ovicide/larvicide and will not control adult mites.
Vendex 50WP	6-8 fluid ounces (1½-2 pounds/acre)	1 day	Do not apply more than 2 times/season. The efficacy of Vendex is reduced when daily temperatures are below 70 F. Toxic to birds, mammals, and fish.
Zeal	2-3 fluid ounces/ acre	1 day	Apply when populations are low. Works better against eggs and larvae (immature mites). Limit to 1 application/season.

**Mite-resistance management plan**

Repeated use of the same miticide is documented to result in a rapid buildup of miticide-resistant strains of mites. To reduce the potential risk of developing resistant mite populations, miticides should be alternated as part of a mite-resistance management plan. If more than one application is needed to control heavy and prolonged mite infestations, always alternate with products of different modes of action. Observe the minimum required spray intervals and restrictions on the amount of product and number of applications/area/seasons. Closely monitor mite populations to determine species, infestation levels, and the presence of predatory organisms. Use miticide sprays only when needed.

**Recommended miticide rotation**

If you follow this rotation of miticides, you should be able to decrease the spider mite population while conserving predatory mites. Scout for mites using a 10X hand lens before you spray. Treat when you see more than five mites per leaflet on young plants. A balance of natural control (predatory mites and other insects that eat the mites) and miticides is the best way to control mites. It may be possible that predatory mites can keep your mites in check, but only if you don't kill them by using a broad-spectrum product that will kill the predators. If you use the wrong product at the beginning of the season (e.g., Brigade), then the entire season could be worse because all the natural enemies were killed by that first spray. In general, mites can become a huge problem if they are sprayed on a schedule. We recommend rotating the following three miticides in the order they are listed.

1. Acramite – Limit to one application per season. This is a contact miticide, meaning that it kills mites that come into contact with the miticide. It also has long residual activity, so larvae that hatch out of eggs will also be killed from the first application.
2. Agri-Mek – If mites are still present, apply this product 21 days after the acramite application. This is best when applied in a paired application; two applications spaced seven to 10 days apart. This product moves in the leaf from the top to the bottom and will remain in the leaf for a period of time. It is less effective when used in cold weather because it does not move in the leaf as well as in warm weather. Combine Agri-Mek with horticultural oil to help movement in the leaf except in extremely hot weather because the oil may burn the leaf. Do not exceed 16 fl. ounces/application or 64 fl. ounces (four applications)/acre in a growing season. Do not apply in less than 100 gallons of water/acre (200 gallons/acre is optimal). Do not repeat treatment within 21 days of second application.
3. Savey – This growth regulator kills eggs, young nymphs (immature mites), and sterilized females. This should also be limited to one application per season.

In general, be sure to include enough water to adequately cover your strawberry plants since most of these are contact miticides. It is important to make sure there is good spray coverage on your plants.

**Note**

Add a spreader sticker or liquid soap to spray the mixture to obtain better coverage. Follow the manufacturer's recommendations.

**Warning**

Always wear appropriate personal protective equipment when handling and spraying pesticides. Re-entry times for workers entering treated fields should be strictly observed. Be sure to check the label for this information.