

HOME ORCHARD PEST MANAGEMENT GUIDE PREFACE

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Home Orchard Pest Management Guides offer suggestions on cultural and chemical control practices that offer a reasonable degree of protection from important fruit diseases and insect pests. Producing quality edible fruit is challenging, growing commercial quality, blemish-free fruit is often an unrealistic expectation. During the growing season weekly monitoring of the crop, and pests which may be present is important. Insecticides work best when pest levels are low. Timely application of controls help minimize damage to fruit. To be effective fungicides need to be applied before appearance of symptoms and/or just prior to and during weather conditions favorable for disease development. In most cases these are periods of moderate to high amounts of rainfall.

Sanitation, which encompasses a variety of cultural practices, such as pruning and removal of diseased and/or dead twigs and branches, raking and removal of leaves and debris, periodically mowing around vines, trees or bushes, and disposing of rotten and/or diseased fruit generally improves disease and insect control. Sanitation, in combination with chemicals, is usually necessary for acceptable control of fruit diseases and insects. A few fruits can be grown successfully with good sanitation alone.

Pre-mixed home fruit or orchard spray products containing pesticides for both disease and insect control are often available. The more dilute products offer the home orchard applicator a greater measure of applicator and dietary safety. For the sake of brevity not all brand names of pesticides are listed. Many may be found by their generic names in the Homeowner Fungicide Guide.

Always consult the product label when purchasing or using pesticides. Be sure the label states the material(s) are labeled for use on your crop, whether it be apple, peach, pear, etc. Carefully follow all precautionary statements. They serve to protect you, the environment and those who consume your crop. Label restrictions are legally binding. General considerations for home orchard pesticide applicators are as follows:

- * Wear goggles or other eye protection to shield yourself from spray drift,
- * Wear long sleeves, long trousers and shoes,
- * Remove and launder clothing worn while applying pesticides, launder these clothes separately from family laundry before reusing them,
- * Always check for and follow the pre-harvest interval(s) listed on the pesticide container(s), and use the longest one, often they are listed in days or hours in (parenthesis),
- * Many pesticides, especially insecticides, are toxic to honey bees as well as other pollinators, do not spray during bloom unless the product label specifically recommends bloom sprays, and do not apply insecticides if bees are foraging on orchard weeds,
- * Assume pesticides to be toxic to fish and other non-target organisms, do not apply to water or where run off can occur,
- * Store pesticides in the original container only.

HOME ORCHARD APPLE DISEASE AND INSECT SPRAY GUIDE

Holly Thornton, IPM Homeowner Specialist
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TIME OF APPLICATION	TO CONTROL	MATERIAL	AMT/GAL	REENTRY INTERVAL	PREHARVEST INTERVAL	REMARKS
<p>Dormant</p> <p>Scale insects, mites and aphids overwinter on the bark of apples. Horticultural oils, also known as superior oils, are the best available control. Make two oil sprays, every winter, between 95% leaf drop (dormant) through pre-bloom stages where buds first swell and bud scales show their initial separation (delayed dormant). Trees severely infested the season before should receive 3 oil applications.</p> <p>Scale Mite eggs Aphid eggs</p> <p>Horticultural oil 2-6 fl ozs 4 to 12 hours Do Not Apply Oils After 1st Bloom</p> <p>Avoid applying oil just before or after extreme temperature changes. For 24 hours before and after oil application temperatures should be below 70°F and above 36°F.</p> <p>Apply 2 fl. ozs. of oil/gal. just after leaf drop or in spring at pre-pink; 6 fl. ozs./gal. when applied during firm winter dormancy.</p> <p>Black rot, bitter rot and white (Bot) rot survive the winter on dead wood in the tree and on the ground. Spores disseminated to apple buds in December, January and February may infect at silver tip. Carefully prune to remove all dead wood from the tree. Disinfect pruners with 10% bleach or rubbing alcohol after each cut. Complete sanitation by removing dead wood from the ground. To control bitter rot, it is also necessary to remove all dried fruit (last year's crop) from trees and the ground.</p> <p>If orchard sanitation the previous year was lax you may not need the pre-pink, pink, bloom and petal fall captan sprays. Consult your county Extension agent for advice on deleting these preventive sprays if your fruit has very little disease and your sanitation is good.</p> <p>Scab, Brooks spot, Alternaria leaf blotch, and Necrotic leafblotch of 'Goldens' overwinter on dead leaves on the ground. Raking and composting or destroying these leaves will control or greatly aid in control of these diseases. Do this as soon after leaf fall as possible.</p>						
Silver tip (when swollen buds first break and develop a silver color)	Black rot	Captan 50WP	3 1/3 Tbs.	4 days	day of harvest	Black rot infection occurs around this time. A very important spray for this disease. Good sanitation is also important for control.
Green Tip	Scale Mite eggs Aphid eggs	Horticultural oil	2 fl ozs	4 to 12 hours	Do Not Apply Oil After 1 st Bloom	Avoid applying oil just before or after extreme temperature changes. For 24 hours before and after oil application temperatures should be below 70°F and above 36°F.
	Leaf Spot	Hi-Yield Improved Lime Sulfur Spray	9.5-13 oz.			Apply 2 fl. ozs. of oil/gal. in spring at pre-pink. Use on Delicious Apples may result in injury. No time limitation.
	Scab	Hi-Yield Improved Lime Sulfur Spray	2-2.5 oz.			Use on Delicious Apples may result in injury. No time limitation.
¼ Inch Green Tip	Aphids	malathion 50EC	2 tsps	12 hours	3 days	
	Fire blight	copper hydroxide (Kocide 101, Hi-Yield Copper Fungicide, KOP-Hydroxide)	see label	1 day	pre-green tip only	Kills bacteria which ooze from overwintering cankers. Crop injury may occur if applied later than ½ inch green tip. Important spray after a bad fire blight year.
Prepink (when center buds first show pink)	Black rot Brooks spot scab	Captan 50WP plus	2 Tbs.	4 days	day of harvest	
	Cedar apple rust	Immunox or Ferbam	½ oz. see label	1 day 1 day	14 days 7 days	Only use Immunox or Ferbam when cedar apple rust is an annual problem.

HOME ORCHARD APPLE DISEASE AND INSECT SPRAY GUIDE (continued)

TIME OF APPLICATION	TO CONTROL	MATERIAL	AMT/GAL	REENTRY INTERVAL	PREHARVEST INTERVAL	REMARKS
Prepink (con.)	Scab Powdery Mildew	Hi-Yield Improved Lime Sulfur Spray Monterey Bi-Carb Fungicide	2-2.5 oz. 3.2 oz			Use of lime sulfurs on Delicious Apples may result in injury. No time limitation.
Pink	black rot	captan 50 WP plus	2 Tbs.	4 days	day of harvest	Fire blight develops on tender shoots and blooms when temperatures are between 65 and 80°F and it is humid and/or raining. If these conditions occur or are forecast, apply streptomycin within 24 hours before rain. Re-spray before the next rain if bee activity has occurred. Use of lime sulfurs on Delicious Apples may result in injury. No time limitation.
	Brooks spot scab	Immunox or ferbam	½ oz. see label	1 day 1 day	14 days 7 days	
	cedar apple rust					
	fire blight	streptomycin (Fertilome Fire Blight Spray)	see label	12 hrs	50 days	
Bloom	Scab Powdery Mildew	Hi-Yield Improved Lime Sulfur Spray Monterey Bi-Carb Fungicide	2-2.5 oz. 3.2 oz.			Conditions conducive to fire blight are listed above. Always spray streptomycin under these conditions. Spray within 24 hours before rain. Re-spray before the next rain if bee activity has occurred or every 3-4 days during the bloom period. Prune out all fire blight affected twigs 12 inches below the disease-killed tissue. Dip pruners in 10% chlorine bleach or rubbing alcohol and wipe between cuts. Oil pruners after use. Do not use Immunox more than ten times per season.
	black rot scab	captan 50WP plus streptomycin (bactericide- Fertilome Fire blight Spray)	2 Tbs. see label	4 days 12 hrs	day of harvest 50 days	
	Fire blight					
	cedar apple rust	Immunox or ferbam	½ oz. see label	1 day 1 day	14 days 7 days	
NO INSECTICIDE DURING BLOOM						
Petal fall (when most petals are off) through Covers 1, 2, and 3 (3 sprays after petal fall); spray every 7-10 days	black rot scab	captan 50WP plus	2 Tbs.	4 days	day of harvest	Spray more frequently, when weather is wet.
	cedar apple rust	Immunox or ferbam	½ oz. see label	1 day 1 day	14 days 7 days	Only use Immunox or ferbam when cedar apple rust is an annual problem.
	black rot scab					Several available home orchard sprays may be used for control of both diseases and insect pests.
	Plant Bugs Oriental fruit moth Codling moth Plum curculio Stink bugs Japanese beetles	malathion 50EC	2 tps	12 hrs	3 days	

HOME ORCHARD APPLE DISEASE AND INSECT SPRAY GUIDE (continued)

TIME OF APPLICATION	TO CONTROL	MATERIAL	AMT/GAL	REENTRY INTERVAL	PREHARVEST INTERVAL	REMARKS
Summer cover sprays (every 14 days until 6 weeks before harvest)	bitter rot sooty blotch fly speck	Captan 50WP	2 Tbs.	4 days	day of harvest	Spray promptly at first sign of bitter rot. This disease spreads rapidly if left unchecked. Several available home orchard sprays may be used for control of both disease and insect pests.
	Plant Bugs Oriental fruit moth Codling moth Plum curculio Stink bugs Japanese beetles	esfenvalerate (Ortho Bug B Gon) or Malathion 50EC	2 tsps	12 hours 12 hrs	21 days 3 days	
Six weeks, 4 weeks and 2 weeks before harvest	bitter rot white rot sooty blotch fly speck	Captan 50WP or sulfur	2 Tbs. see label	4 days 1 day	day of harvest day of harvest	Important disease control sprays, particularly for bitter rot and white rot. Do not use sulfur when temperatures are expected above 90 degrees. Some varieties such as MacIntosh, Red Delicious, Staymen, Baldwin, King, Golden Delicious and Jonathan are sensitive to sulfur.
	Oriental fruit moth Codling moth Plum curculio Stink bugs Leafrollers	malathion 50EC	2 tsps	12 hours	3 days	Pre-harvest insecticide applications 14-days pre-harvest and again 3 to 5 days before harvest is very good insurance against late occurring pest attracted to ripe fruit.
	Japanese beetles Green June beetles	carbaryl 50EC (Sevin) or malathion 50EC	1 Tbs. 2 tsps	12 hours 12 hours	3 days 3 days	Carbaryl (Sevin) is a good material for control of Japanese or green June beetles.

HOME ORCHARD BLUEBERRY DISEASE AND INSECT SPRAY GUIDE

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TIME OF APPLICATION	PESTS	MATERIALS	AMT/GAL	REENTRY INTERVAL	PREHARVEST INTERVAL	REMARKS
Dormant	Phomopsis twig blight	Lime sulfur (Hi-Yield Lime Sulfur Spray)	see label			Apply lime sulfur when bud begins to swell. Avoid excessive nitrogen fertilization. Pruning old canes and diseased growth may decrease the severity of blight diseases.
<p>Before bud break</p> <p>Sanitation, in the form of removing dead berries and debris under the bushes during the winter will reduce disease pressure from Botrytis blight and mummy berry. Compost or destroy debris. Replace with new mulch. Do not place mulch right up against the trunk of the plant. With good sanitation, and little or no history of Botrytis blight and mummy berry, there should be no need for green tip and pre-bloom sprays. If these diseases have been damaging in the past, spray every 7-10 days thru bloom.</p>						
Green tip, from the first green tissue after bud break to first bloom, spray every 7-10 days	Botrytis blight	Captan 50WP	2.5 Tbs.	4 days	day of harvest	
<p>The fungi causing Botrytis blight and mummy berry overwinter in dead berries and debris under the bushes. Remove dead berries, debris, and mulch during the winter and compost or destroy it. Replace with new mulch. Do not place mulch right up against the trunk of the plant. With good sanitation and little or no history of Botrytis blight and mummy berry, there should be no need for green tip and pre-bloom sprays. If these diseases have been damaging in the past, spray every 7-10 days thru bloom.</p>						
10-20% bloom and full bloom	Botrytis blight, Mummy berry, & Anthracnose	Captan 50WP	2.5 Tbs.	4 days	day of harvest	DO NOT APPLY INSECTICIDES DURING BLOOM Botrytis causes flower and twig blight.
Petal Fall to 4 weeks after petal fall	as-needed for Cranberry fruitworm	malathion 50EC	2 tsp.	12 hrs	24 hrs	Cranberry fruitworm (CFW) is an internal feeding caterpillar. CFW go from berry to berry within clusters. Monitor for infestations normally in early varieties such as 'Climax', and spray as-needed.

HOME ORCHARD BRAMBLE DISEASE AND INSECT SPRAY GUIDE

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Blackberries can often be grown successfully without pesticides, if you practice good sanitation, and have no wild blackberries nearby. Important fungal and insect pests of blackberry canes overwinter on old canes that were infected the previous season. Cut and remove old canes to the ground after harvest. Do not cut with a rotary mower as pieces will become too small to remove. Cut old fruiting canes from fall-fruiting raspberry cultivars such as 'Heritage' in early spring before new shoots begin to develop. This method produces a single fall crop. Strawberry weevil is not a problem on fall bearing raspberry cultivars such as 'Heritage'. A weeks to 10 days after cutting, plants should to be fertilized and irrigated to force new growth for next year's crop. Plants infected with orange rust, which can be detected from green tip to early cane growth must be promptly dug up and removed or destroyed.

TIME OF APPLICATION	TO CONTROL	MATERIALS	AMT/GAL	REENTRY INTERVAL	PREHARVEST INTERVAL	REMARKS
Delayed dormant (Blackberries only)	Leaf and cane spot	copper hydroxide (Nu-Cop, Hi-Yield Copper Fungicide, KOP-Hydroxide) or liquid lime sulfur	see label	1-2 days (see label)	None listed	Apply as delayed dormant spray after training in the spring
	Anthraxnose		see label	see label	Dormant/delayed dormant only	Apply lime-sulfur at delayed dormant, but prior to 3/4-inch shoot stage to avoid leaf burn.
Green tip	Anthraxnose, Leaf and cane spot	copper (Top Cop w/ Sulfur, Dragon Copper Fungicide, Bonide Liquid Copper)	see label	Until dry	None listed	See remarks above this guide. Avoid overhead watering Labeled copper products available under several different brand names.
<p>Orange rust attacks all brambles except for red raspberries. The fungus infects in a systemic fashion, once plants are infected they remain so for life. Infected plants are stunted and produce very little fruit. They can be identified in the early spring. Shortly after leafing out, the lower surface of infected leaves develops orange pustules that gives the disease its name. Prompt removal of orange rust infected plants is most important to control this disease. Inspect plants in early spring. Try to identify orange rust infected plants by scouting for pustules before the orange spores are produced. Once spores are released, they cause new infections that may not show up until the following spring. Dig up, remove and dispose of or destroy these plants. Nearby wild brambles should also be destroyed.</p>						
When buds appear and new canes are 8-12" high	Anthraxnose, Leaf and cane spot	copper (Top Cop w/ Sulfur, Dragon Copper Fungicide, Bonide Liquid Copper)	see label	Until dry	None listed	
Pre-bloom	Anthraxnose, Leaf and cane spot	copper (Top Cop w/ Sulfur, Dragon Copper Fungicide, Bonide Liquid Copper)	see label	Until dry	None listed	Repeat at 10-14 day intervals as necessary
<p>Strawberry weevils are small (1/10 inch long) reddish brown snout beetles. Adults kill flower buds and blossoms by severing or "clipping" most or all of the stem just below the bloom. Eggs are laid in these damaged blooms. Adult strawberry weevils will typically move from strawberries to blackberries and raspberries. Summer blooming raspberries should be watched, but they are less likely to be attacked.</p>						
	as-needed for Strawberry weevil	carbaryl 50EC (Sevin)	1 Tbs	12 hrs	7 days	Use only if strawberry weevils or their damage are present.
Bloom	Botrytis Flower Blight, Rosette (Double blossom)	micronized wettable sulfur (Microthiol Special)	see label	1 day	0 days	DO NOT SPRAY INSECTICIDE DURING BLOOM.
	Powdery Mildew Botrytis Fruit Rot	Rovral 4F (iprodione)	see label	24 hours	day of harvest	Do not make more than 4 applications/season.

HOME ORCHARD BRAMBLE DISEASE AND INSECT SPRAY GUIDE (continued)

TIME OF APPLICATION	TO CONTROL	MATERIALS	AMT/GAL	REENTRY INTERVAL	PREHARVEST INTERVAL	REMARKS
<p>Rosette or double blossom (<i>Cercospora rubi</i>) occurs on both blackberries and raspberries, but is most damaging to blackberries. Double blossom symptoms markedly change the appearance of the plant. In the spring, infected buds from the previous year produce numerous leafy sprouts. This proliferation of shoots is referred to as a witches broom. Several of these witches brooms may occur on one cane. As flower buds open, petals are pinkish in color, wrinkled and twisted. Berries do not develop from infected blossoms, uninfected parts of the same plant produce smaller, poorer quality fruit. Sanitation to prevent double blossom is similar to that of orange rust. Wild brambles should be removed from the immediate area. They can serve as sources of inoculum. Remove and destroy old fruited canes after harvest. Infected blossom clusters should be removed before they open. Where this disease is especially severe on trailing blackberries, cut off plants at the ground after fruiting. This extreme practice only works well where the growing season is long. For other brambles, cut all canes back to 12 inches immediately after harvest. Fertilize and irrigate plants to force new growth before winter.</p> <p>Red-necked cane borer (RNCB) adults are slender, 1/4 inch long, black beetles with an iridescent coppery-red to golden thorax or "neck". Larvae are legless, white, and have flattened heads. They are 3/4 inch when mature. They tunnel in bramble canes above or below the swollen galls they induce in bramble canes. Sanitation by mowing for rosette or selective removal of galled canes will suppress RNCB populations. Insecticides timed to adult emergence (generally in May) will also help reduce RNCB populations.</p>						
Just after bloom, through May	as-needed for Strawberry weevil or Red necked cane borer or Mites	carbaryl 50EC (Sevin) or malathion 50EC or Ortho Max (bifenthrin 0.3EC)	1 Tbs. or 2 tsp. or 3 Tbs.	12 hrs or 12 hrs or 12 hrs	7 days or 1 day or 3 days	Spray for RNCB if removal of canes is not providing acceptable control. Apply as-needed if mites and injury are present.
After old canes have been removed	Anthracnose, leaf and cane spot or Orange rust	copper (Dragon Copper Fungicide, Bonide Liquid Copper) or *	see label	Until dry	none listed	See introductory section. Labeled copper products available under several different brand names. Avoid overhead watering.

*Carbamate WDG is no longer registered by the U.S. Environmental Protection Agency for blackberries or raspberries. There are no other labeled chemicals available to control orange rust. If any become available, we will notify your county agent.

HOME ORCHARD BUNCH GRAPE DISEASE AND INSECT SPRAY GUIDE

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TIME OF APPLICATION	TO CONTROL	MATERIALS	AMT/GAL	REENTRY INTERVAL	PREHARVEST INTERVAL	REMARKS
<p>Dormant season sanitation helps reduce disease pressure. Fungal rot organism of grapes overwinter on old vines and dried fruit on the vines and ground. Vines should be pruned back to the main stem each winter, leaving only 1 vine of the previous year's growth for each wire. Fruit and leaves on the ground should be raked and composted or destroyed.</p>						
Dormant - mid-winter	Anthracnose Powdery Mildew	liquid lime sulfur Hi-Yield Improved Lime Sulfur Spray	see label 2.5-6.5 fl.oz.	see label	see label	Do not apply lime sulfur and superior oil within 30 days of each other. Objective of lime sulfur spray at this time is to reduce fungal inoculum on canes.
Pre-bloom beginning with 1-2 inches green, apply every 7 days until bloom	Black rot Powdery mildew, downy mildew, anthracnose	mancozeb (DithaneM45, Maneb 80WP)	see label	1 day	see label	Use mancozeb if downy mildew is a problem
		or Immunox	2 oz.	1 day	14 days	Use Immunox if anthracnose is a problem. Do not make more than 6 applications of Immunox (@ 2 oz./gal) per season.
		or ferbam	see label	see label	7 days	
	as-needed for Plant bugs Flea beetles	carbaryl 50EC (Sevin) or malathion 50EC	1 Tbs. 2 tsp.	12 hrs 12 hrs	7 days 3 days	Apply an insecticide when plant bugs or flea beetles are present and damage is evident.
Bloom - 10% bloom and full bloom	Black rot, Powdery mildew	Captan 50WP	2 Tbs	4 days	day of harvest	DO NOT APPLY INSECTICIDE DURING BLOOM. Do not apply more than 24 lbs. Maneb 80WP or Dithane M45 per acre per crop season. Do not apply mancozeb within 66 days of harvest.
		or mancozeb (Dithane M45, Maneb 80WP)	see label	1 day	66 days	
		or Immunox	2 oz.	1 day	14 days	
		or ferbam	see label	see label	7 days	
DO NOT APPLY INSECTICIDES OF ANY KIND DURING BLOOM, OR INJURY TO BEES AND OTHER POLLINATORS MAY OCCUR.						
Cap fall and 1st Cover (10 days after cap fall)	Black rot, powdery mildew	Captan 50WP	2 Tbs	4 days	day of harvest	
		or Immunox	2 oz.	1 day	14 days	
	downy mildew	as needed copper hydroxide (Kocide 101, Hi-Yield Copper Fungicide, KOP-Hydroxide)	see label	1 day	see label	Foliage injury may occur on copper sensitive varieties such as Concord, Delaware, Niagara and Rosettes. Test for sensitivity.
<p>Grape berry moth larvae feed on flowers and fruit of bunch grapes early in the season. Larvae enter fruit near the stem or where grapes touch each other. Scout and spray as-needed.</p>						
	as-needed for Plant bugs Flea beetles Leafrollers Grape berry moth	plus carbaryl 50EC (Sevin) or malathion 50EC	1 Tbs. 2 tsp.	12 hrs. 12 hrs.	7 days 3 days	Apply insecticide if injury and pests are present.

HOME ORCHARD BUNCH GRAPE DISEASE AND INSECT SPRAY GUIDE (continued)

TIME OF APPLICATION	TO CONTROL	MATERIALS	AMT/GAL	REENTRY INTERVAL	PREHARVEST INTERVAL	REMARKS	
Summer cover sprays every 14 days until 14 days before harvest	black rot	Captan 50WP	2 Tbs	4 days	day of harvest	Do not make more than 6 applications of Immunox (@ 2 oz./gal) per season.	
	powdery mildew	or Immunox	2 oz.	1 day	14 days		
	Grape curculio are small (1/10 inch) reddish-black snout beetles. Adults emerge and move to fruit to feed and lay eggs around mid-June in central Georgia. Adults feed on the underside of leaves in a zig-zag pattern. Spray if weevils are found.						
	as-needed for Grape curculio	carbaryl 50EC (Sevin)	1 Tbs.	12 hrs	7 days		
	Japanese beetles	or malathion 50EC	2 tsp.	12 hrs	3 days		
	Green June beetles	or					
	as-needed for Mites	Sun Spray Ultra Fine Oil	2-3 Tbs.	12 hrs	day of harvest	Do not apply to heat or drought stressed vines.	
Preharvest (7 days before harvest)	Black rot	Captan 50WP	2 Tbs	4 days	day of harvest	Do not apply any pesticides after the product's pre-harvest interval.	
	as-needed for Green June beetles	carbaryl 50EC (Sevin)	1 Tbs	12 hrs	7 days		
		or malathion 50EC	2 tsp	12 hrs	3 days		
Mid June and between Thanksgiving and Christmas	Grape root borer	Construct a 1 ft high soil mound for 1.5 feet around each vine between early and mid June. Knock the mounds down between Thanksgiving and Christmas. Do not fail to knock mounds down.			Grape root borers can kill grapevines. Borers tunnel inside vines at or below ground level, weakening or killing them. All grapes (bunch, muscadine and vinifera) are susceptible. Mounding provides cultural control. It is 60-90% effective when done correctly. Mounding uses layers of soil to make it more difficult for young larvae to reach the roots or for adults to emerge.		

HOME ORCHARD MUSCADINE GRAPE DISEASE AND INSECT SPRAY GUIDE

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Muscadine grapes may yield satisfactorily without the aid of pesticides. Carefully inspect plants at least once a week, and treat as-needed for angular leaf spot and for insect pests. Angular leaf spot is most damaging in July or early August. Uncontrolled angular leaf spot often can result in almost complete defoliation which terminates further fruit development. When wet weather favors disease cover sprays from bloom to harvest will sometimes be needed to prevent severe losses from ripe rot, *Macrophoma* rot and bitter rot. Dormant season sanitation will reduce disease pressure. Most diseases overwinter on dead leaves and fruit on the vine and the ground. Removing this material usually will benefit or give sufficient disease control.

TIME OF APPLICATION	TO CONTROL	CHEMICAL	AMT/GAL	REENTRY INTERVAL	PREHARVEST INTERVAL	REMARKS
PRE-BLOOM						
Every 14 days from Bud Break until Bloom	Black Rot Bitter Rot	mancozeb	2 Tbs	1 day	4 days	BLACK ROT susceptible varieties should be sprayed with fungicide every 14 days from the start of new growth until after bloom. This disease develops on the fruit during and just after bloom. Where ripe rot is a problem, use Captan 50WP.
		captan 50WP or Immunox or ferbam	3 Tbs 2 oz see label	4 days 1 day see label	day of harvest 14 days 7 days	
	as-needed for Plant Bugs Flea Beetles	carbaryl 50EC (Sevin) or malathion 50EC	1 Tbs 2 tsp	12 hrs 12 hrs	7 days 3 days	If plant bugs or flea beetles have been a problem or are present and damaging, it may be necessary to spray insecticide shortly before bloom, at cap fall (petal fall) and at 1st cover. Always scout and treat only as-needed.
BLOOM						
Bloom	Black Rot Bitter Rot	mancozeb	2 Tbs	1 day	4 days	BLACK ROT susceptible varieties should be sprayed with fungicide every 14 days from the start of new growth until after bloom. This disease develops on the fruit during and just after bloom. Where ripe rot is a problem, use Captan 50WP.
		captan 50WP or Immunox or ferbam	3 Tbs 2 oz see label	4 days 1 day see label	day of harvest 14 days 7 days	
DO NOT APPLY INSECTICIDES OF ANY SORT DURING BLOOM OR INJURY TO BEES AND OTHER POLLINATORS MAY OCCUR.						
COVER SPRAYS						
Cap fall, First Cover and every 14 days from second cover until 6 to 8 weeks before harvest	Black rot, ripe rot <i>Macrophoma</i> rot	Captan 50WP or Immunox	3 tbs 2 oz	4 days 1 day	0 days 14 days	Captan may cause mild phytotoxicity to fruit if applied when conditions are cool and wet.

HOME ORCHARD MUSCADINE GRAPE DISEASE AND INSECT SPRAY GUIDE

TIME OF APPLICATION	TO CONTROL	CHEMICAL	AMT/GAL	REENTRY INTERVAL	PREHARVEST INTERVAL	REMARKS
COVER SPRAYS (continued)						
Cap fall, First Cover and every 14 days from second cover until 6 to 8 weeks before harvest (cont.)	Plant Bugs Flea Beetles Grape Berry Moth Grape Curculio	As-needed at Cap (Petal) Fall and First Cover and thereafter when insects and damage are present:				Grape berry moth is an occasional pest with high damage potential. It is a mid to late season pest in muscadines. Scout and spray insecticide if damage and pests are found.
	Japanese Beetles June Beetles	carbaryl 50EC (Sevin) or malathion 50EC	1-2 Tbs 2 tsp	12 hrs 12 hrs	7 days 3 days	Grape curculio is an occasional, but sometimes serious pest. The adults are small 1/10 inch long red-black snout weevils. They emerge around June 15 and feed on the underside of leaves in a shallow zig-zag pattern for about 2 weeks before they begin laying eggs. Scout and spray insecticide if damage and pests are found. Japanese and green June beetles can be serious pests. Treat as-needed when beetles are present and damaging. Multiple sprays are sometimes required to control heavy beetle presence.
MITES may damage grapes. They feed on leaves by roughing and rasping the leaf surface and consuming the sap released. Mites can become a serious problem, and they are capable of explosive population growth. Treat if more than 15 mites per leaf are found or if leaves are bronzed from mite feeding. Drought and heavy crop load aggravate mite injury, especially early in a growing season. Two treatments at 1 week intervals may be needed.						
	as-needed for Mites	Sun Spray Ultrafine Spray Oil	2-3 Tbs	12 hrs	day of harvest	May apply the day of harvest. Use with caution as phytotoxicity may occur. Do not apply to drought stressed plants. Do not apply when temperatures and humidity are high; wait until late afternoon or early evening.
PREHARVEST SPRAYS						
Every 10 to 14 days during the last 6-8 weeks before harvest (Start July 1 on the Coastal Plain and July 10-14 in Middle Georgia)	Bitter Rot Macrophoma Rot Ripe Rot Angular Leaf spot	Captan 50WP or fruit tree spray	3 Tbs see label	4 days see label	day of harvest see label	Captan may be applied up to day of harvest. Most home fruit sprays require a 14 day preharvest interval for grapes. Check the individual product label.
	as-needed for Grape berry moth June beetle	carbaryl 50EC (Sevin) or malathion 50EC	1-2 Tbs 2 tsp	12 hrs 12 hrs	7 days 3 days	Green June beetle and Japanese beetle populations can increase very rapidly. Moderate defoliation is seldom damaging, but fruit feeding is injurious. Do not allow these pests to feed heavily on and become abundant in blocks with ripe fruit. Beware of heavy emergence and migration to ripe fruit after rains. Multiple applications are often necessary to maintain control if high populations develop. Ripening fruit and aggregation pheromones are very attractive and continue to draw new beetles to the vines.
GRAPE ROOT BORERS can kill grapevines. Borers tunnel inside vines at or below ground level, weakening, or killing them. All grapes (bunch, muscadine, vinifera) are susceptible. Use a layer of soil to make it more difficult for young larvae to reach the roots or adults to emerge. Mound soil 1 foot high and 1 ½ feet out from the base of each vine by early- to mid-June. It is equally important to knock these mounds back down between early November and Christmas. Mounding provides cultural control. It is 60-90% effective when done correctly.						

HOME ORCHARD PEACH, NECTARINE AND PLUM DISEASE AND INSECT SPRAY GUIDE

Holly Thornton, Homeowner IPM Specialist
Dan L. Horton, Extension Entomologist

TIME OF APPLICATION	TO CONTROL	MATERIAL	AMT/GAL	REENTRY INTERVAL	PREHARVEST INTERVAL	REMARKS
Dormant sprays - Leaf drop until early bud swell	Bacterial spot, Leaf curl	copper hydroxide (Kocide 101, Hi-Yield Copper Fungicide, KOP-Hydroxide, Polysul Summer and Dormant Spray)	see label	2 days	21 days	Do not apply copper hydroxide with oil. Cooper rate reductions are tied to crop development, rates must be reduced as the season progresses. Note rates at various stages.
	Leaf curl Shot hole Scab	liquid lime sulfur or Ortho Garden Disease Control (Daconil 2787)	see label	see label	Do not apply after petal fall	Preventative leaf curl sprays at this time are for cooler areas of the state where leaf curl occurs (primarily upper piedmont and mountains).
		or ferbam or Bordeaux mixture or Hi-Yield Improved Lime Sulfur Spray	3/4 Tbs see label see label	2 days 1 day until dry	Do not apply after shuck split 21 days dormant spray only	Liquid lime sulfur and ferbam can be combined with one of the oil sprays listed below. Ortho Daconil 2787 and copper hydroxide cannot. If leaf curl has been severe, a fungicide application should also be made after leaf drop in the fall. Do not apply oil or oil plus fungicide after buds break.
	Scale	Horticultural (Superior) Oil	12.5-15 fl. oz.	see label.	see label	
			2-6 fl. ozs.	4 to 12 hours	Do Not Apply After 1 st Bloom	Apply 2 fl ozs of oil/gal. just after leaf drop or again in spring at pre-pink; apply 6 fl ozs during firm winter dormancy. Avoid applying oil just before or after extreme temperature changes. For 24 hours before and after oil application temperatures should be below 70°F and above 36°F.
Pink to 5% bloom	Bacterial spot	copper hydroxide (Kocide 101, Hi-Yield Cooper Fungicide, KOP-Hydroxide)	see label	2 days	21 days	Cooper rate reductions are tied to crop development, rates must be reduced as the season progresses. Note rates at various stages.
	Brown Rot Shot Hole Scab Jacket rot	Rovral 4F (iprodione)	See label	12 hour re-entry interval	Do not apply after petal fall.	Do not make more than 2 applications/season. Apply when pink, white, or red bud.
Bloom	Blossom blight (early season phase of brown rot - blossoms turn brown and die) Scab	Ortho Daconil 2787 or captan 50WP	3/4 tsp 2 Tbs	2 days 4 days	Do not apply after shuck split day of harvest	This a very important spray for suppression of pre-harvest brown rot. Make this preventative application every year.
		liquid lime sulfur (Hi-Yield Improved Lime Sulfur) or Immunox	see label ½ oz	see label 1 day	Do not apply after petal fall day of harvest	
	DO NOT USE INSECTICIDE DURING BLOOM.					

HOME ORCHARD PEACH, NECTARINE AND PLUM DISEASE AND INSECT SPRAY GUIDE (continued)

TIME OF APPLICATION	TO CONTROL	MATERIAL	AMT/GAL	REENTRY INTERVAL	PREHARVEST INTERVAL	REMARKS
Petal fall (when most of the petals have fallen) through Cover Sprays 1, 2 and 3 apply every 7 to 10 days	Bacterial spot	copper hydroxide (Kocide 101, Hi-Yield Cooper Fungicide, KOP-Hydroxide)	see label	2 days	21 days	Use caution if coppers are used post-bloom. The recommended rate reductions lessen, but do not eliminate phytotoxicity.
	Brown rot Scab	Ortho Daconil 2787	3/4 tsp	2 days	shuck split only	Avoid use of sulfur when temperatures are above 90°F.
		or captan 50WP	2 Tbs	4 days	day of harvest	
		or sulfur	see label	1 day	day of harvest	
	Plant Bugs Oriental fruit moth Codling moth Plum curculio Stink bugs Japanese beetles	or Immunox	½ oz	1 day	day of harvest	
malathion 50EC		2 tsp	12 hours	7 days (peach only)		
Summer cover sprays (every 14-21 days until mid-June)	Scab Brown rot	Captan 50WP	2 Tbs	4 days	day of harvest	Do not use Ortho Home Orchard Spray within 21 days of harvest.
		or sulfur	see label	1 day	day of harvest	
		or Immunox	½ oz	1 day	day of harvest	
	Powdery Mildew	Hi-Yield Improved Lime Sulfur Spray	0.5 fl. oz.			
Plant Bugs Oriental fruit moth Codling moth Plum curculio Stink bugs Japanese beetles	malathion 50EC	2 tsp	12 hours	7 days (peach only)		
Pre-harvest Disease Spray - 2 weeks and 1 week before harvest for each variety	Brown rot	Captan 50WP	2 Tbs	4 days	day of harvest	Avoid use of sulfur when temperatures are above 90°F.
		or sulfur	see label	1 day	day of harvest	
Insecticide - (28 and 14 days pre-harvest)	Oriental fruit moth Codling moth Plum curculio Stink bugs Japanese beetles	or Hi-Yield Improved Lime Sulfur Spray	4 tsps.			Apply 3 to 5 times at weekly intervals before harvest.
		malathion 50EC	2 tsp	12 hours	7 days (peach only)	

HOME ORCHARD PEAR DISEASE AND INSECT SPRAY GUIDE

Holly Thornton, Homeowner IPM Specialist
Dan L. Horton, Extension Entomologist

TIME OF APPLICATION	TO CONTROL	MATERIAL	AMT/GAL	REENTRY INTERVAL	PREHARVEST INTERVAL	REMARKS
Dormant - before buds begin to swell	fire blight	Bordeaux mixture	8 Tbs. copper sulfate plus 8 Tbs. hydrated lime	see label	dormant spray only	DO NOT APPLY AFTER GREEN IS SHOWING. Several leaf spot fungi overwinter on cankers on diseased or dead twigs and on leaves on the ground. Pruning and removing diseased wood and raking, composting or destroying these leaves each fall will aid in disease control.
Dormant to Delayed Dormant	Scale Mite eggs Aphid eggs	horticultural oil	2 fl ozs when applied just after leaf drop or in spring at pre-pink; 6 fl ozs when applied during winter when dormancy is firm	12 hours	Do Not Apply After 1 st Bloom	Avoid applying oil just before or after extreme temperature changes. For 24 hours before and after oil application temperatures should be below 70°F and above 36°F.
Scale insects, mites and aphids overwinter on the bark of pear. Horticultural oils, also known as superior oils, are the best available control. Make two oil sprays, every winter, between 95% leaf drop (dormant) through pre-bloom stages where buds first swell and bud scales show their initial separation (delayed dormant). Trees severely infested the season before should receive 3 oil applications.						
Between Silvertip and Green Tip	Aphids	malathion 50EC	2 Tbs	12 hours	1 day	
Green cluster bud	Scab	or if needed Ortho Home Orchard Spray or Hi-Yield Improved Lime Sulfur Spray	5 Tbs 4-6 tsp	12 hrs	7 days	If scab has been a problem use Ortho Home Orchard Spray (same as white bud) instead of malathion. Scab spores are at their highest number just after this spray.
White bud (Popcom)	fire blight	streptomycin sulfate or	100 parts per million - see table below	12 hrs	30 days	Apply streptomycin just before the earliest blooms open, and every 3-4 days thru petal fall for fireblight.
		copper hydroxide (Kocide 101, Hi-Yield Copper Fungicide, KOP-Hydroxide)	see label	1 day	see label	Fire blight starts only when the trees are blooming, temperatures are between 65 and 80°F, and it is humid or raining. If these conditions occur, streptomycin needs to be applied within 24 hours before the rain. Do not re-apply until there has been a period of bee activity and another rain occurs. Prune out all fire blight affected twigs 12 inches below the disease-killed tissue. Dip pruners in 10% chlorine bleach or rubbing alcohol between cuts. Oil pruners after use.
Bloom - every 5 days	Fire blight	streptomycin sulfate (Fertilome Fire blight)	100 parts per million - see table below.	12 hrs	30 days	DO NOT APPLY INSECTICIDE DURING BLOOM. Apply streptomycin every 5 -7 days when weather is favorable for fire blight (see above).
		or copper hydroxide (Kocide 101, Hi-Yield Copper Fungicide, KOP-Hydroxide)	see label	1 day	see label	

HOME ORCHARD PEAR DISEASE SPRAY GUIDE (continued)

TIME OF APPLICATION	TO CONTROL	MATERIAL	AMT/GAL	REENTRY INTERVAL	PREHARVEST INTERVAL	REMARKS
Petal fall - when most of the petals are off and again 10-14 days after petal fall	Scab fungal leaf spots	Ortho Home Orchard Spray	5 Tbs.	12 hrs	7 days	Avoid use of sulfur when temperatures are above 90° F. D'Anjou pears are sensitive to sulfur.
Petal Fall through Covers 1, 2 and 3, make disease & insect sprays every 7 to 10 days	Plant Bugs Oriental fruit moth Codling moth Plum curculio Stink bugs Japanese beetles	malathion 50EC	2 Tbs	12 hours	1 day	
Summer Cover Sprays	Plant Bugs Oriental fruit moth Codling moth Plum curculio Stink bugs Japanese beetles as needed Mites	malathion 50EC Ortho Max (bifenthrin 0.3EC)	2 Tbs 3 Tbsp	12 hours 12 hours	1 day 14 days	 Carbaryl (Sevin) is a good insecticide for green June beetles.
When first leaves have completely unfolded	Scab bitter rot fungal leaf spots	Ortho Home Orchard Spray	5 Tbs.	12 hrs	7 days	Ortho Home Orchard Spray contains captan (a fungicide) and malathion and methoxychlor (insecticides).
Preharvest 28 days and 14 days pre-harvest	Scab Bitterrot Plant Bugs Oriental fruit moth Codling moth Plum curculio Stink bugs Japanese beetles or Green June beetles	Ortho Home Orchard Spray carbaryl 50EC (Sevin)	5 Tbs 1 Tbs	12 hrs 12 hours	7 days 3 days	

ANTIBIOTIC FORMULATIONS FOR A 100 PPM SOLUTION

MATERIAL	TSP./GAL.	OZS./100 GALS.
Agrimycin 17, 21.3% streptomycin sulfate	3/4 tsp.	8 ozs.
Agristrep, 21.2% streptomycin sulfate	3/4 tsp.	8 ozs.
Ortho Streptomycin, 21% streptomycin sulfate	3/4 tsp.	8 ozs.

HOMEOWNER STRAWBERRY DISEASE AND INSECT CONTROL

Holly Thornton, Homeowner IPM Specialist
Dan L. Horton, Extension Entomologist

TIME OF APPLICATION	TO CONTROL	MATERIAL	AMT/GAL	REENTRY INTERVAL	PREHARVEST INTERVAL	REMARKS
Dormant season sanitation will reduce disease pressure most years. Strawberry leaf spots and Botrytis blight overwinter on old leaves and debris on the bed. Clipping old leaves, raking, and composting or destroying greatly aids in disease control.						
New growth, begin as soon as new growth starts, and every 10-14 days until just before bloom.	Leaf spots Anthracnose Botrytis blight (Gray mold)	Captan 50WP	2 tsp	1 day	day of harvest	During periods of frequent rainfall, sprays at 7-10 day intervals may be necessary. Do not use more than 48 lbs of Captan per acre per crop.
Pre-bloom, just before bloom	as-needed for Strawberry weevil (clipper)	malathion 50EC	2 tsp	12 hrs	3 days	Strawberry weevils are small (.1/.10 inch long) reddish brown snout beetles. Adults kill flower buds and blossoms by severing or "clipping" most or all of the stem below the bloom. Eggs are laid in these damaged blooms. Adults will typically move from strawberries to blackberries and raspberries. Apply insecticide when fresh injury, pest presence or history of problems exist.
		or carbaryl 50EC (Sevin)	1 tsp	12 hrs	7 days	
10% bloom	Leaf spots, Botrytis blight and other fruit rots	Captan 50WP	2 Tbs	1 day	day of harvest	DO NOT APPLY INSECTICIDES DURING BLOOM. Critical time for Botrytis (Gray mold) control begins here.
Full bloom	Leaf spots, Botrytis blight and other fruit rots	Captan 50WP	2 Tbs	1 day	day of harvest	DO NOT APPLY INSECTICIDES DURING BLOOM.
Petal Fall (immediately post-bloom)	as-needed for Strawberry weevil (clipper)	malathion 50EC or carbaryl 50EC (Sevin)	2 tsp 1 Tbs	12 hrs 12 hrs	3 days 7 days	Strawberry weevils are small (.1 inch long) reddish brown snout beetles. Adults kill flower buds and blossoms by severing or "clipping" most or all of the stem below the bloom. Eggs are laid in these damaged blooms. Adults will typically move from strawberries to blackberries and raspberries. Apply insecticide when fresh injury, pest presence or history of problems exist.
Every 10-14 days from bloom until harvest.	Leaf spots, Botrytis blight and other fruit rots	Captan 50WP	2 Tbs	1 day	day of harvest	Under severe gray mold conditions, apply immediately after each picking through harvest. During periods of frequent rainfall, sprays at 7-10 day intervals or less may be necessary.
Year round	as-needed of mites	Sun Spray Ultra Fine Spray Oil	2 Tbs	12 hrs	0 days	Apply when mites, webs and damage are observed. Two applications 5-7 days apart are necessary. Thorough coverage is needed to get good control. In the coastal plain, mites may reach damaging numbers during the winter months. Do not use Sun Spray Ultra Fine Spray Oil on plants that are heat or drought stressed. Use caution, as phytotoxicity may occur.

WEED RESPONSE TO HERBICIDES USED IN FRUITS AND NUTS

Wayne E. Mitchem, Extension Weed Scientist

	Diuron, etc.		Devrinol		Solicam		Sinbar		Prowl		Oryzalin		simazine		Gallery	
Application Method ¹	PRE		PRE		PRE		PRE		PRE		PRE		PRE		PRE	
Time of Year ²	S	F	S	F	S	F	S	F	S	F	S	F	S	F	S	F
BIENNIAL AND PERENNIAL WEEDS																
asters	F	G	P				F	G	P	P	P	P		G		G
bahiagrass	P	P	P	P	P		P-F	P-F	P	P	P	P	P	P	P	P
bermudagrass	P	P	P	P	F	F	F	P	P	P	F	F	P	P	P	P
briars	P	P	P	P	P	F	P	P	P	P	P	P	P	P	P	P
camphorweed			P			G	F		P	P	P	P		G	P	P
dallisgrass	P	P	P	P	F		P-F	P-F	P	P	P	P	P	P	P	P
dogfennel	P	F	P	P		E	G	G	P	P	P	P	P	F	G	G
horsenettle	P-F	P	P	P	P	P	F	P	P	P	P	P	P-F	P	P	P
johnsongrass	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
nutsedge	P	P	P	P	P-F		P-F	P-F	P	P	P	P	P	P	P	P
plantains				G		G		F	P	P	P	P	P	G	G	G
wild garlic/onion	P	P	P			G			P	P	P	P	P	P	P	P
ANNUAL GRASSES																
barnyardgrass	G		E		G		G		G		G		G		P	P
crabgrass	G		E		G-E		G		E		E		G		P	P
crowfootgrass	G		E		G		G		E		E		G		P	P
fall panicum	F		G		E		G		G		G		G		P	P
goosegrass	G		G		E		G		E		E		G		P	P
johnsongrass (seedling)	F		E		G		G		G		G		P		P	P
ryegrass, annual		G		F				F		F		F-G		G-E	P	P
sandbur	G		E		G		G		G		E		G		P	P
signalgrass, broadleaf	G		G		G		G		E		G		P		P	P
Texas panicum	P		G		F		F		G		G		F		P	P
ANNUAL BROADLEAF WEEDS																
bristly starbur	G		P		F		E		P		P		F		P	P
chickweed	G	G		E	E	E		E		G		G		G		G
cocklebur	G		P		F		G		P		P		F		P	P
crotalaria	G		P				G		P		P				P	P
croton, tropic	G		P		E		G		P		P		F-G		P	P
evening primrose		G	F	G			F	G	P		P			G-E		G
Florida beggarweed	G		F		G		E		P		P		G		P	P
Florida pusley	G		E		G		E		G		G		G		F	F

WEED RESPONSE TO HERBICIDES USED IN FRUITS AND NUTS (continued)

	Duiron, etc.		Devrinol		Solicam		Sinbar		Prowl		Surflan		Princep, etc.		Gallery	
Application Method:	PRE		PRE		PRE		PRE		PRE		PRE		PRE		PRE	
Time of Year:	S	F	S	F	S	F	S	F	S	F	S	F	S	F	S	F
ANNUAL BROADLEAF WEEDS (continued)																
horseweed	F	G	P	F	G	G	G	G	P	P	P	P	P	G		G
jimsonweed	G		P		G		E		P		F		F-G		G	
lambsquarters	E		E		F		E		E		E		E		E	
morningglories	G		P		F-G		G-E		P		F		F-G		F	
pigweeds	G		G		F		E		G		G		F-G		E	
prickly lettuce		G		E	G			E	P	P	P	P	G	E		G
prickly sida (teaweed)	G		P		G-E		E		P		P		F-G		G	
purslane, common	E		E		E		E		E		E		E		E	
ragweed, common	E		F		G		E		P		P		G		E	
sicklepod	G		P		F		E		P		P-F		F-G			
wild radish	F-G	G	F	G	F	G	E	E	P	P	P	P	G	E		E

¹ PRE = Preemergence.

² S = Spring; F = Fall.

Key to Response Symbols: E = Excellent Control; G = Good Control; F = Fair Control; P = Poor Control.
If no symbol is given, weed does not occur in specific season (spring or fall) or weed response is unknown.

WEED RESPONSE TO HERBICIDES USED IN FRUITS AND NUTS (continued)

	Chateau		MSMA		Oxyfluorfen		Fusilade Select.		glyphosate		Paraquat Gramoxone		2,4-D		Poast	
Application Method:	PRE		PDS		PRE		PDS		PDS		PDS		PDS		PDS	
Time of Year:	S	F	S	F	S	F	S	F	S	F	S	F	S	F	S	F
BIENNIAL AND PERENNIAL WEEDS																
asters					F	F	P	P	G	E	F	F	F		P	P
bahiagrass	P	P	F		P	P	F	P	F	F	F	F	P	P	F	P
bermudagrass	P	P	P		P	P	G	F	F	G	F	P	P	P	G	P-F
briars	P	P			P	P	P	P	P-F	G-E	P	P	F	F	P	P
camphorweed	P	P				G	P	P	G		F				P	P
dallisgrass	P	P	F		P	P	F	F	G	G	F	P	P	P	P	P
dogfennel	P	P					P	P	G	G	F	P			P	P
horsenettle	F	P			P	P	P	P	F	G	P	P	F		P	P
johnsongrass	P	P	F-G		P	P	G	P	F	G	F	P	P	P	G	F
nutsedge	P	P	G		F	F	P	P	F	G	F	F	P		P	P
plantains	G	P					P	P	E	E	F	F	G	G	P	P
wild garlic/onion							P	P	G	G	F	F	G	G	P	P
ANNUAL GRASSES																
barnyardgrass	G		G		F		G		E		G		P	P	G	
crabgrass	G		G		F		G		E		G		P	P	G	
crowfootgrass	G		G		F		G		E		G		P	P	G	
fall panicum	G		G				G		E		G		P	P	G	
goosegrass	G		G		F		G		E		G		P	P	G	
johnsongrass (seedling)	G		G				E		E		E		P	P	E	
ryegrass, annual		G	F		P		G	G	G	G	F	G	P	P	E	E
sandbur			G		P		G		E		G		P	P	G	
signalgrass, broadleaf	G		F		P		E		E		G		P	P	E	
Texas panicum	G		F		P		E		E		E		P	P	E	
ANNUAL BROADLEAF WEEDS																
bristly starbur	G		F		F-G		F	P	G		F-G		G		P	
chickweed	G	G					P	P	G	G	F	G	F	F	P	P
cocklebur	G		E		G		P	P	E		G		E	E	P	
crotalaria			G		E		P	P	E		G		G		P	
croton, tropic	G		F		E		P	P	E		F-G		G		P	

WEED RESPONSE TO HERBICIDES USED IN FRUITS AND NUTS (continued)

	Chateau		MSMA		Oxyfluorfen		Fusilade Select ¹		Glyphosate		Paraquat Gramoxone ²		2,4-D		Poast	
Application Method:	PRE		PDS		PRE		PDS		PDS		PDS		PDS		PDS	
Time of Year:	S	F	S	F	S	F	S	F	S	F	S	F	S	F	S	F
ANNUAL BROADLEAF WEEDS (continued)																
evening primrose	G	G			F	G	P	P	P-F	F	F	F-G	F	G	P	P
Florida beggarweed			E		P		P		E		E		F		P	
Florida pusley	G		F		E		P		G		F ³		F		P	
horseweed	G	G			P	F	P	P	G-E	G-E	F ⁴	F	G		P	P
jimsonweed	G		F		G		P		E		G		E		P	
lambsquarters	G		F		E		P		G		G		E		P	
morningglories	G		F		F-G		P		G		G		G		P	
pigweeds	E		F		E		P		G		G		G		P	
prickly lettuce						G	P	P	G	G	F	G	G	G	P	P
prickly sida (teaweed)	G		P		E		P		G	F	G	P	G		P	
purslane, common	G		F		E		P		E		G		E		P	
ragweed, common	G		F		E		P		G		G		E	E	P	
sicklepod			F		F		P		G		E		E		P	
wild radish	G	G			G-E	E	P	P	E	E	F	G	G	G	P	P

¹ PRE = Preemergence; PDS = Postemergence Directed Spray.

² S = Spring; F = Fall.

³ Gramoxone will control only the seedling stages of Florida pusley.

⁴ Gramoxone and Rely provide only contact control of many species.

⁵ Fusilade and Prism are fluzifop and clethodim, respectively; and have similar activity on most weeds. Weed response also reflects Select herbicide.

Key to Response Symbols: E = Excellent; G = Good Control; F = Fair Control; P = Poor Control.

If no symbol is given, weed does not occur in specific season (spring or fall) or weed response is unknown.

WEED RESPONSE TO HERBICIDES USED IN FRUITS AND NUTS (continued)

	Aim		Rely		Velpar		Sempra		Basagran		Stinger	
Application Method:	PDS		PDS		PRE/ PDS		PDS		PDS		PDS	
Time of Year:	S	F	S	F	S	F	S	F	S	F	S	F
BIENNIAL AND PERENNIAL WEEDS												
asters			G	G	E	E						
bahiagrass			F	F	F							
bermudagrass			F	F	P	P						
briars			G	G	F	F						
camphorweed					G							
dallisgrass			F	F	F							
dogfennel			G	G	G				F			
horsenettle			F	F	F							
johnsongrass					F							
nutsedge			F	F	F		E		G			
plantains			G	G	G	G						
wild garlic/onion			G	G	G							
ANNUAL GRASSES												
barnyardgrass			G	G	F							
crabgrass			G	G	G							
crowfootgrass			G	G	F							
fall panicum			G	G	F							
goosegrass			G	G	F							
johnsongrass (seedling)			G	G	F							
ryegrass, annual			G	E								
sandbur			G	G	F							
signalgrass, broadleaf			G	G	F							
Texas panicum			G	G	F							
ANNUAL BROADLEAF WEEDS												
bristly starbur			G	G	G				G			
chickweed			E	E	G	G						
cocklebur	G		G	G	G		E		E		E	
crotalaria					G				P			
croton, tropic			G	G	G				G			

WEED RESPONSE TO HERBICIDES USED IN FRUITS AND NUTS (continued)

	Aim		Rely		Velpar		Sempra		Basagran		Stinger	
Application Method:	PDS		PDS		PRE/ PDS		PDS		PDS		PDS	
Time of Year:	S	F	S	F	S	F	S	F	S	F	S	F
ANNUAL BROADLEAF WEEDS (continued)												
evening primrose	F-P		G	G	E	E						
Florida beggarweed			G	G	F							
Florida pusley					G							
horseweed			G	G	G	E						E
jimsonweed	G				G				E			E
lambsquarters	E		G	G	G		F		F			
morningglories	G		G	G	F		F		F			
pigweeds	G		G	G	G		G		P			
prickly lettuce	F				G	G						E
prickly sida (teaweed)			G	G	F				G			
purslane, common	G		G	G	G				G			
ragweed, common			G	G	G		E		G			E
sicklepod			G	G	F							E
wild radish	F		G	G	G	G	E	E	G	G		

¹ PRE = Preemergence; PDS = Postemergence Directed Spray.

² S = Spring; F = Fall.

³ Gramoxone will control only the seedling stages of Florida pusley.

⁴ Gramoxone and Rely provide only contact control of many species.

⁵ Fusilade and Prism are fluzafop and clethodim, respectively; and have similar activity on most weeds. Weed response also reflects Select herbicide.

Key to Response Symbols: E = Excellent; G = Good Control; F = Fair Control; P = Poor Control.

If no symbol is given, weed does not occur in specific season (spring or fall) or weed response is unknown.