



HOMEOWNER'S

Fruit and Nut

SPRAY GUIDE

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Insects and diseases can cause problems in peaches, plums, nectarines and pecans. Homeowners who grow these fruit trees can more easily identify the problems and select the proper control methods if they are familiar with insect pests and diseases, their life cycles and the damage they cause.

Because such problems vary from one area of Texas to another and from one year to the next, it is important that you keep records of pest and disease occurrences. These records can help you make wise control decisions, such as the timing of pesticide applications.

Plant diseases are the most severe in periods of frequent rain or dew and mild temperatures (75 to 85 degrees F). Early-maturing peach varieties are more likely to be affected by brown rot than are late-maturing varieties; late varieties are often damaged more by peach scab.

Cultural practices

Healthy plants can survive some insect and disease damage better than stressed plants. Trees grow best if you select adapted disease-resistant varieties, follow a well-balanced fertility program, and irrigate and prune as needed.

It's important to clean up and dispose of residue to reduce the damage from pecan scab,

plum curculio, hickory shuckworm, and brown rot of peach. Diseased material that is properly composted can be recycled as mulch or organic material.

Pesticide options

Homeowners face a number of problems in buying chemical products to control diseases and insects. Such products are not as available to homeowners as they once were, and the most effective ones are not always packaged in small quantities. If you buy commercial-size packages, the cost is high, the unused portion must be stored for a long time, and the label lists the rates in amounts per acre, which is difficult to convert when mixing a few gallons of spray material.

Another problem is that many products have limits on the number of times they can be applied per season. These limitations may require that you buy more than one chemical to control a disease or insect season-long, which increases the costs and storage problems.

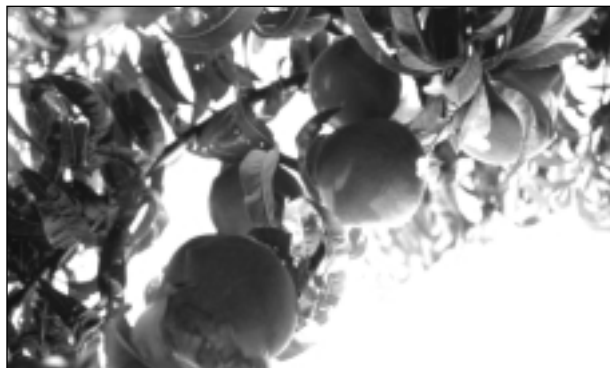
In some cases, a commercial-size package is your only option. The number of larger packages was limited as much as possible in this guide, but that also limits the pesticide selection. To get a bigger selection, fruit hobbyists with more than a few trees should consider agricultural-size packages. For homeowners with just a few trees, the best option may be the premixed (insecticide + fungicide) products available at nursery and garden centers (see Table 4).

Disease-control products available in small packages are listed in Table 3. There are so many insect-control options that a complete listing is impractical here. When buying a pesticide, be certain that you will be using it for the purpose stated on the label.

Pecans

The spray guide for pecans is based primarily on insect biology and life cycles, because generally more pecan losses are from insects than disease. If you plant scab disease-resistant varieties, you may need to treat only for insects. Another reason to concentrate on insect control is the fact

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that pecan fungicides are available only in commercial-size packages. Apply zinc foliar sprays frequently at the beginning of the season.

Peaches and plums

The most important times to apply disease-control products are at petal fall, shuck split and preharvest. You can use combination products (insecticide and fungicide together) for early- and mid-season treatments, but most have preharvest limitations that prevent application close to harvest, when brown rot control is critical.

Pesticide safety

Before using any pesticide, carefully read all the instructions on the container. Follow instructions such as the need to wear protective clothing during mixing or spraying. Take the necessary precautions when applying pesticides to avoid being exposed to chemicals.

Mix pesticides in a well-ventilated area or outdoors. Avoid chemical contact with your skin, and do not breathe chemical vapors.

Apply pesticides at the proper rate. If you use less chemical than is prescribed, it may not control the pests well; if you use more than is recommended, you may damage the plant or leave too much residue on the fruit.

Store chemicals in a secure area away from pets and children. Prepare only the amount required for one application. Dispose of any unused, diluted sprays and empty pesticide containers properly. Store pesticides in their original containers.

The pesticides suggested in this guide are registered and labeled for use by the Environmental Protection Agency and the Texas Department of Agriculture. Regulations on pesticides are subject to change, and may have changed since this publication was printed. The USER is always responsible for the effects of pesticide residues on livestock and crops, as well as for problems caused when the pesticide drifts or moves to others' property. **Always read and carefully follow the instructions on the container label.**

For more information, contact your county Extension agent.

Table 1. Homeowner's Spray Guide for Pecans.

Timing	Pest	Pesticide	Rate/1 gal. water ¹	Remarks
Dormant season (winter)	Insects Scale insects, mite eggs, phylloxera	97% oil emulsion	10 Tbs or 1 qt/6 gal	Spray tree trunks and branches thoroughly. Apply only once, in late dormant but before budbreak.
Budbreak (just as the buds begin to split and show green color) terminal bud growth should be 2 inches in length.	Nutritional Rosette	Zinc sulfate WP or Zinc nitrate (NZN) liquid	2 tsp	Zinc sprays are essential for early-season pecan growth. Early, frequent applications work best. Elemental zinc is toxic to most plants other than pecans and grapes; therefore, avoid drift. If drift is a possibility, do not use zinc sulfate near peaches, plums, nectarines, apricots or other zinc-sensitive plants. Do not use any zinc product at rates higher than the label stipulates, because it can burn the foliage. When applying more than one zinc spray in 2 weeks, reduce the rate by half. Never spray young trees that are not actively growing.
	Insects Phylloxera	Chlorpyrifos (Dursban 6.6% EC) or (Dursban 12.6%EC) or Malathion (Malathion 50% EC)	2 oz 1 oz 2 Tbs	If dormant oil was not used, then treat trees where a history of phylloxera damage indicates a need for control.

¹ Because the concentration of pesticides varies in different products, refer to the label for the specific rate per 1 gallon spray solution.

² Agricultural-size package
WP = wettable powder
EC = emulsifiable concentrate
DF = dry flowable

Pecans (continued)

Timing	Pest	Pesticide	Rate/1 gal. water ¹	Remarks
Budbreak (just as the buds begin to split and show green color) terminal bud growth should be 2 inches in length. (continued)	Diseases Scab and other foliage and nut diseases	Benomyl (Benlate [®] 50% WP) ²	1/2 - 1 Tbs	Do not apply after shuck split. Limit is 3 applications per season at the high rate.
		or Thiophanate-methyl (Topsin-M [®] 70% WP) ²	1/2 - 1 Tbs	Do not apply after shuck split.
		or Fenbuconazole (Enable [®] 2F) ²	1 1/2 tsp/10 gal	Do not apply after shuck split. Limit is 4 applications/season.
Prepollination (when leaves are one-third grown and before pollen is shed)–mid-April	Nutritional Rosette	Same as for budbreak.		
	Diseases Scab and other foliage and nut diseases	Same as for budbreak.		
	Insects Fall webworm	<i>Bacillus thuringiensis</i>	Refer to label.	Repeat sprays as pest problem recurs. Look for eggs on undersides of leaves. For more information, see Extension publication L-1811, "Fall Webworm."
		or Chlorpyrifos (Dursban 6.6% EC)	2 oz	
		or (Dursban 12.6 EC)	1 oz	
		or Malathion (Malathion [®] 50% EC)	2 tsp	
	or Carbaryl (Sevin [®] liquid)	Refer to label.		
Pollination (when casebearer eggs appear on tips of nutlets)–May	Nutritional Rosette	Same as for budbreak		Using pecan nut casebearer traps will help you time the sprays. Apply sprays during egg hatch. (Consult your county Extension agent for precise local timing or see Extension publication L 5134, "Controlling Pecan Nut Casebearer.") For walnut caterpillar, look for eggs on the undersides of foliage. The absence of foliage also indicates walnut caterpillar damage. No webs are associated with walnut caterpillars.
	Insects Pecan nut casebearer and walnut caterpillar	Same as for prepollination		
	Diseases Scab and other foliage and nut diseases	Same as for budbreak		

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Pecans (continued)

Timing	Pest	Pesticide	Rate/1 gal. water¹	Remarks
Second-generation casebearer (42 days after first casebearer spray)	Insects Pecan nut casebearer	Same as for prepollination		Treat yellow aphids when an average of 25 per compound leaf are found or when excessive honey dew is produced. Repeated use of insecticides can result in strains of aphids that resist insecticides. This can increase losses. Treat black pecan aphids when 3 or more are found per compound leaf. This insect is common in late season.
	Aphids	Malathion (Malathion 50% EC) or Dimethoate (Cygon® EC)	2 tsp Refer to label.	
	Diseases Scab and other foliage and nut diseases	Same as for budbreak		
Cover sprays	Diseases Scab	Same as for budbreak		The number of cover sprays is based on weather conditions, variety and presence of scab fungus. Maintain spray applications as long as weather conditions favor disease development.
Water stage (when inside of the nut begins to fill with liquid)–mid to late July	Diseases Scab and other foliage and nut diseases	Benomyl (Benlate® 50% WP) ²	1/2 - 1 Tbs	Treat where there is a history of disease or when rainfall is prolonged.
		or Thiophanate-methyl (Topsin-M® 70% WP) ²	1/2 - 1 Tbs	
Half-shell hardening–mid to late August	Insects Aphids	Same as for aphids listed above		Treat yellow aphids when they average 25 per compound leaf or when excessive honey dew is produced and aphid populations persist. Treat black pecan aphids when 3 or more are found per compound leaf. This insect is common in late season.
	Hickory shuckworm	Carbaryl (Sevin® liquid) Chlorpyrifos (Dursban 6.6% EC) or (Dursban 12.6%EC)	Refer to label. 2 oz 1 oz	
	Pecan weevil	Carbaryl (Sevin® liquid)	Refer to label.	Treat areas with a history of pecan weevil infestation. One to three treatments at 10-14 day intervals are needed for heavy weevil infestations. Make first application around August 20.
	Diseases Scab and other foliage and nut diseases	Same as for budbreak		

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Table 2. Homeowner's Spray Guide for Peaches and Plums.

Timing	Pest	Pesticide	Rate/1 gal. water ¹	Remarks
Dormant season	Insects Scale insects	97% dormant oil or	10 Tbs or 1 qt/6 gal	Apply when temperature is between 40 and 70 degrees F. Apply only if scale are observed. Repeat applications in 2-3 weeks.
		chlorpyrifos (Dursban 6.6% EC)	1 1/2 oz	
Late dormant	Diseases Peach leaf curl	Copper fungicide or Chlorothalonil (see listing of products, Table 3)	Refer to label for specific rate	Apply if there is a history of leaf curl.
Petal-fall (when flower petals begin to fall)-5 days after bloom (combination products are an option-see Table 4).	Insects Plum curculio	Malathion (Malathion 50% EC) or	2 1/2 tsp	Apply when 75 percent of petals have fallen, and there is a history of insect damage.
		Carbaryl (Sevin® liquid) or	Refer to label.	
		Endosulfan (Thiodan 9.7% EC)	1 1/2 Tbs	
	Peach twig borer	Diazinon (Diazinon® 25% EC) or	Refer to label.	The peach twig borer usually is a problem only in the West Cross Timbers area.
		Lindane (Lindane 20% EC)	2 Tbs	Do not apply lindane to fruit or foliage. Do not apply within 60 days of harvest.
	Lesser peach tree borer	Endosulfan (Thiodan 9.7% EC)	2 Tbs	For best control, thoroughly treat trunk and main branches. Usually two applications are required, one immediately after harvest and a second 3-4 weeks later.
	Diseases Scab	Captan (Captan 50% WP) ² or Sulfur 90% WP (see listing of products, Table 3) or Benomyl (Benlate® 50% WP) ² or Thiophanate-methyl (Topsin-M® 70% WP) ² or Chlorothalonil (see listing of products, Table 3)	2 3/4 Tbs	Treat where there is a history of disease problems.
4 Tbs				
1-2 Tbs				
1-2 Tbs				

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Peaches and Plums (continued)

Timing	Pest	Pesticide	Rate/1 gal. water ¹	Remarks
Shuck split (when the calyx separates from base of newly formed fruit) 14 days after bloom (Combination products are an option—see Table 4.)	Insects Catfacing insects, plum curculio	Same insecticides as for petal fall.		Treat where there is a history of catfacing insects and/or plum curculio.
	Diseases Scab	Same fungicides as for petal fall except for benomyl		
First cover (30 days after bloom) (Combination products are an option—see Table 4.)	Insects Catfacing insects, plum curculio	Same as for petal fall		Treat where there is a history of disease problems.
	Diseases Scab	Captan (Captan 50% WP) ² or Sulfur WP (see listing of products, Table 3)	2 3/4 Tbs 4 Tbs	
Cover sprays (repeat at 14-day intervals) (Combination products are an option—see Table 4.)	Insects Catfacing insects	Same insecticides as for petal fall.		
	Diseases Brown rot	Same fungicides as for first cover.		
Pre-harvest (for early-maturing varieties and during periods of frequent rain or dew—spray 3 weeks, 2 weeks and 3 days before picking; for mid- to late-maturing varieties—spray at 2 weeks and at 3 days before picking) (Combination products are an option—see Table 4.)	Insects June beetles and wasps	Carbaryl (Sevin [®] liquid)	Refer to label.	June beetles and wasps are attracted to and feed on ripe fruit. Treat only if insects are present.
	Diseases Brown rot	Benomyl (Benlate [®]) ² 50% WP or Thiophanate-methyl (Topsin M [®] 70% WP) ²	1-2 Tbs 1-2 Tbs	Do not apply within 3 days of harvest. Do not apply within 1 day of harvest.
		Captan (Captan 50% WP) ²	2 3/4 Tbs	Do not apply within 1 day of harvest.
Post harvest—mid to late August	Insects Peach tree borer	Chlorpyrifos (Dursban [®] 12.6%) or	4 oz	For best results, treat for borers after Sept. 1. Thoroughly wet from base of tree up to first scaffold limbs.
		Lindane (Lindane [®] 20% EC) or	1 Tbs	Do not apply Lindane or Chlorpyrifos to fruit or foliage, and do not apply them within 60 days of harvest.
		Endosulfan (Thiodan [®] 9.7% EC)	2 Tbs	Use 2 applications, 3-4 weeks apart.

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Peaches and Plums (continued)

Timing	Pest	Pesticide	Rate/1 gal. water ¹	Remarks
Post harvest–mid to late August (continued)	Diseases Peach rust	Chlorothalonil (See listing of products–Table 3).	Refer to label	Begin applications at first sign of rust in the summer and continue at 2- to 3-week intervals until early October. Rust is a problem in counties south of a line from Houston to Hallettsville and Rio Grande City.

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Table 3. Products Available in Small Packages for Disease Control on Peaches and Plums.

Pesticide	Trade name	Brand name	Rate/gal.	PHI/days*
Chlorothalonil	Multi-Purpose Fungicide - Daconil (29.6%)	Ortho	2 1/4 tsp	Do not apply after shucksplit.
	Lawn and Garden Fungicide w/Daconil 2787 (12.5%)	Dexol	1 Tbs	Do not apply after shucksplit; not cleared on plums.
	Encore (12.5%) Monterey Bravo® Flowable Fungicide (40.4%)	Pro-Tech Monterey	1 Tbs 1-1 1/2 Tbs/ 2 1/2 gal	Do not apply after shucksplit; not cleared on plums.
(Copper fungicides are not cleared for use on plums.)				
Copper ammonium complex	Liqui-Cop	Monterey	2 Tbs	Do not apply after full bloom.
Copper sulfate	Tri-Basic Bordeaux Powder	Black Leaf	4 Tbs	Do not apply after pink bud.
Copper hydroxide	Liquid Copper Fungicide	Natural Guard	2-4 tsp	Apply at leaf fall.
Sulphur	Dusting Sulphur 90% Wettable Dusting Sulfur 90%	Ferti-Lome	4 Tbs	0
		Hi-Yield	4 Tbs	0
Myclobutanil	Immunox Multi-Purpose Fungicide 1.55%	Spectracide	1/2 fl oz	0
	Multi-Purpose Fungicide 1.55%	KGRO	1/2 fl oz	0

* PHI = Pre-harvest interval, the minimum number of days before harvest that product can be used.

Table 4. Combination Products for Disease and Insect Control on Peaches and Plums.

Pesticide	Trade name	Brand name	Rate/gal.	PHI/days*
Captan 10% + malathion 7.5%	Fruit Tree Spray	Ferti-Lome	3 1/2 Tbs	Peaches - 7 Plums - 3
Captan 15% + malathion 7.5% + methoxychlor 15%	Home Orchard Spray	Ortho	5 Tbs	21 - not cleared for use on plums
Captan 12% + malathion 6% + methoxychlor 12% + carbaryl 0.3%	Liquid Fruit Tree Spray	Black Leaf	2 1/2 Tbs	21 - not cleared for use on plums
	Liquid Fruit Tree Spray	Green Thumb	2 1/2 Tbs	21 - not cleared for use on plums
	Rescue	Pro Tech	2 1/2 Tbs	21 - not cleared for use on plums

* PHI = Pre-harvest interval, the minimum number of days before harvest that product can be used.

Organic disease management

Some fungicides and insecticides are made of naturally occurring ingredients and are considered acceptable for organic gardening. For allowed products, refer to the Texas Department of Agriculture Organic Certification Program Materials List (TDA publication Q694A).

Peaches, plums, nectarines and apricots: Use sulfur fungicides throughout the spray program. Make applications at the shortest interval allowed. Shortened intervals are important during the late bloom, shuck split and first cover period and again during the preharvest period. These are periods when fruit diseases are the most damaging.

Pecans: Copper sulfate is considered an organic fungicide, and some formulations are approved for use on pecans to control pecan scab and other foliage diseases. Copper sulfate is highly toxic to fruit trees such as peaches, plums, apricots and nectarines, and to some ornamental plants. Be care-

ful when using this product around sensitive plants if there is a possibility of drift.

General considerations: For infection to occur, most plant diseases require that the leaf, fruit or nut remain wet for a certain period. The following precautions reduce the length of time the plant is wet after dew or rainfall:

- Prune the trees to allow sunlight to penetrate the leaf canopy.
- Space the trees to allow for air circulation.
- Plant trees in an area that will receive early-morning sun and where air circulation is not blocked by buildings or other plants.
- Avoid wetting trees during irrigation.

Select varieties that have natural resistance to the major diseases of your area. Resistance does not mean that the plants are immune to infections. Fungicide applications will usually be more effective on plants with some resistance.

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