

# Fruit & Nut

## Disease Control Products

For Use in Texas





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# Fruit and Nut Disease Control PRODUCTS FOR USE IN TEXAS

**T** By George L. Philley\*

his listing of chemicals to control fruit diseases is a reference for county Extension agents and fruit producers in Texas. It is not an exhaustive list of every cleared product and formulation, but does contain the most readily available and representative products for each active ingredient. Just as in human medicine, there are generic products containing the same active ingredient; for plants there are disease control products that contain the same active chemical. Also, the same chemical may be formulated several ways (liquid or powder) and at different concentrations.

Therefore, while many trade name products contain the same active ingredient, especially from the same company, some were omitted from this listing to save space. Sulfur is a good example. Sulfur is marketed at different concentrations of dusts, liquids and wettable powders.

## Explanation of the listings

The diseases listed in the first column come from product labels. They are not arranged in order of importance. Like-wise, the active ingredients (common chemical names) in the second column and the products in the formulation column are in no particular order. The formulation names are trade names; below each is stated the percentage of active ingredient and the type of product. In the remarks section, the number followed by an asterisk is the pre-harvest interval in

days. Example: 7\* indicates a 7-day interval from last application to harvest. At the end of the publication is a listing of all trade name products and the companies selling those products.

## Information on specific crops

### **Blackberries**

Ziram Granuflo® is cleared on blackberry for one application to control evergreen canker. Because the disease is not known in Texas, the product is not listed in the blackberry section.

### **Peaches**

Several copper products are cleared for use on peaches as cover sprays for bacterial spot. Because of potential phytotoxicity to foliage, growers are strongly cautioned to gain experience with copper fungicides on a small area before treating an entire crop.

Suggested rates of copper materials for post bloom application are listed in the "2004 Southeastern Peach, Nectarine and Plum Pest Management and Culture Guide," which is available through county Extension offices.

### **Pecans**

Certain copper fungicides are cleared on pecan for *Phytophthora* kernel rot and zonate leaf spot. These two diseases are not serious enough in Texas to require annual treatment; therefore, a copper fungicide is not included. Coppers could be used to help eliminate nonpathogenic plants such as algae, mosses and lichens. Sulfur is also cleared for use on pecan for powdery mildew and spider mite control but is not listed under the pecan section for the same reason as stated for the copper products. For specific spray schedules, contact your county Extension agent.

### **Persimmons**

No disease control chemical has been cleared for use on persimmon.

### **Figs**

No disease control chemical has been cleared for use on fig. Many sulfur formulations are cleared for mite control.

## Terms and abbreviations

\* – pre harvest interval in days

DF – dry flowable

F – flowable

L – liquid

WDG – wettable dispersable granule

WG – wettable granule

WP – wettable powder

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# APPLE

WSP – water soluble powder

Disease	Chemical	Formulation	Rate	Remarks
Scab, powdery mildew, fly speck, sooty blotch, black rot, fruit rots	Thiophanate methyl	Topsin M 70 WP 70% WP	1-1.5 lb/A	0.* See resistance management section on label.
		T-Methyl 70 W WSB 70% WP	1-1.5 lb/A	0.* See resistance management section on label.
	Trifloxystrobin	Flint 50% WDG	2-3 oz/A	14.* Limit 11 oz/A/season and 3 consecutive applications
Scab, black rot, sooty blotch, fly speck, bot rot, bitter rot	Captan	Captan 50 Wettable Powder 50% WP	4-8 lb/A	0.* Limit 64 lb/A/season. Some varieties are sensitive.
		Captan 80 WP 80% WP	2.5-5 lb/A	0.* Limit 40 lb/A/season
		Captec 4L 38.2% F	2-4 qt/A	0.* Limit 32 qt/A/season
		Captan 50 W 50% WP	4-8 lb/A	0.* Limit 64 lb/A/season. Some varieties are sensitive
		Captan 4L 37.6%L	2-4 qt/A	0*
Fire blight, crown rot, collar rot, anthracnose	Copper hydroxide	Kocide 101 77% WP	8-16 lb/A	Early-season application only for fire blight
		Kocide DF 61.4% DF	8-16 lb/A	Early-season application only for fire blight
		Kocide 4.5 LF 37.5% L	5.3-10.6 pt/A	Early-season application only for fire blight
		3 lb Copper 37.5% L	0.66-1.33 gal/A	Early-season application only for fire blight
		Nu-Cop 3 L 37.5% L	0.6-1.3 gal/A	Early-season application only for fire blight
		KOP-Hydroxide 37.5% L	2.66-5.33 pt/ 100 gal	Early-season application only for fire blight
		Champ Formula 2 37.5% L	5.5-10.5 pt/A	Early-season application only for fire blight
		Nu-Cop 50 DF 77% DF	8-16 lbs/A	Early-season application only for fire blight
		KOP-Hydroxide 50W 77% WP	8-16 lb/A	Early-season application only for fire blight
Champion WP 77% WP	8-16 lb/A	Early-season application only for fire blight		
Scab, rust, leafspot, black rot, powdery mildew, flyspeck, sooty blotch, fruit rots	Kresoxim-methyl	Sovran 50% WDG	4-6.4 oz/A	30.* Limit 25.6 oz/A/season
Powdery mildew, rust, scab	Myclobutanil	Nova 40 W 40% WSP	1.25-2.5oz/ 100 gal or 2.5-5.0 oz/A	14.* Limit 5 lb/A/season
	Fenarimol	Rubigan EC 12% L	8-12 oz/A	30.* Limit 84 oz/A/season
	Triflumazole	Procure 50 WS 50% WS	8-16 oz/A	14.* Limit 64 oz/A/season
Scab, rust, sooty blotch, flyspeck, bitter rot	Ziram	Ziram 76 DF 76% DF	6-8 lb/A	14.* Limit 56 lb/A/season
		Ziram Granuflo	6-8 lb/A	14.* Limit 56 lb/A/season

## APPLE (continued)

76% WDG				
Disease	Chemical	Formulation	Rate	Remarks
Scab, rust, sooty blotch, flyspeck, bitter rot (continued)	Ferbam	Ferbam Granuflo 76% WP	3-8 lb/A	7.*
Rust, powdery mildew	Triadimefon	Bayleton DF 50% DF	2-8 oz/A	45.* Limit 24 oz/A/season
Rust, Fabrea leaf spot, flyspeck, scab, sooty blotch	Maneb + zinc	Manex 37% L	2-4.8 qt/A	77.* Limit 16.8 qt/A/season
	Maneb	Maneb 75 DF 75% DF	3 lb/A	77.* Limit 22.4 lb/A/season
	Maneb	Maneb 80 WP 80% WP	3 lb/A	77.* Limit 21 lb/A/season
Fabrea leafspot, rusts, scab	Mancozeb	Penncozeb 75 DF 75% DF	3 lb/A	77.* Limit 22.4 lb/A/season
		Penncozeb 80 WP 80% WP	3 lb/A	77.* Limit 21 lb/A/season
		Dithane DF 75% DF	3.2 lb/A	77.* Limit 22 lb/A/season
		Dithane F-45 37% F	2.4 qt/A	77.* Limit 16.8 qt/A/season
		Dithane M-45 80% WP	3 lb/A	77.* Limit 21 lb/A/season
		Manex II 37% L	2.4 qt/A	77.* Limit 16.8 qt/A/season
		Manzate 75 DF 75% DF	3 lb/A	77.* Limit 21 lb/A/season
Scab, rust	Metiram	Polyram 80 DF 80% DF	3-6 lb/A	77.* Limit 24 lb/A/season
Scab	Dodine	Syllit 65 W 65% WP	1-3 lb/A	7.* Can cause injury under certain conditions
	Cyprodinil	Vanguard WG 75% WDG	3-5 oz/A	72.* Tank mix with a protectant or systemic fungicide is suggested.
Scab, powdery mildew	Sulfur	Liquid Sulfur Six 52% L	0.75-3.5 pt/ 100 gal	0*
		Sulfur 6 L 52% L	1.5-5 gal/A	0*
		That Flowable Sulfur 52% L	1-12 pt/ 100 gal	0*
		Sulfur Flowable 6 52% L	0.75-5 gal/A	0*
		EM-53 Red Ball 53% L	1.5-3.5 pt/ 100 gal	0*
		Sulfur 90 W 90% WP	8-26 lb/A	0*
		Microperse Wettable Sulfur 90% WP	15-30 lb/A	0*
		Microthiol Disperss 80% WP	10-20 lb/A	0.* Some varieties sensitive
MicroSulf 80% WP	10-20 lb/A	0*		

## APPLE (continued)

Disease	Chemical	Formulation	Rate	Remarks
Fire blight	Copper ammonium complex	Copper-Count-N 8% L	1-2 qt/A	Apply during bloom period. Some varieties sensitive. See label for other diseases.
	Copper oxychloride + basic copper sulfate	C-O-C-S WDG 74.8 + 14.2% WDG	0.25-4 lb/ 100 gal	Early-season application only for fire blight
	Streptomycin sulfate	Agri-mycin 17 22.4% WP	24-48 oz/A	50*
		Streptrol 21.3% WP	24-48 oz/A	50*
		AS-50 65.8% WP	8-16 oz/A	30*
	Basic copper sulfate	Basicop 53% WP	0.5-1.0 lb/100 gal	Apply during bloom.
		Basic Copper '53' 98% WP	2 lb/A	Apply during bloom.
	Mancozeb + copper hydroxide	ManKocide 15% + 46.1% DF	8-16 lb/A	Apply pre-bloom.
Fosethyl-Al	Aliette WDG 80% WDG	2.5-5 lb/A	Apply before or during bloom. Limit 20 lb/A/season	
Phytophthora crown and root rot	Mefenoxam	Ridomil Gold EC 49% L	0.5 pt/100 gal	Apply in spring and fall after harvest.
	Fosethyl-Al	Aliette WDG 80% WDG	2.5-5 lb/A	14* Limit 20 lb/A/season
Storage rots	Captan	Captan 50 Wettable Powder 50% WP	2.5 lb/100 gal	Post-harvest dip or spray
		Captec 4L 38.2% L	1.25 qt/100 gal	Post-harvest dip or spray
		Captan 50 W 50% WP	2.5 lb/100 gal	Post-harvest dip or spray
		Captan 80 WP 80% WP	1.6 lb/100 gal	Post-harvest dip or spray
		Captan 4 L 37.6% L	1.25 qt/A	Post-harvest dip or spray
	Thiabendazole	Mertect 340 F 42.3% L	16 oz/100 gal	Post-harvest dip or spray
		Decco Salt No. 19 98.5% L	1-2 bags (575 g/bag) /300 gal	Post-harvest dip or spray
Scab, rust, bitter rot, black rot, blotch, plus others	Thiram	Thiram Granuflo 75% WP	5.2-6.8 lb/A	0.*

## APRICOT

Disease	Chemical	Formulation	Rate	Remarks
Leaf curl, brown rot, scab	Chlorothalonil	Echo 720 54% L	3.12-4.12 pt/A	Shuck split *
		Echo 90 DF 90% DF	2.2-3.5 lb/A	Shuck split *
		Bravo Weather Stik 54% L	3.12-4.12 pt/A	Shuck split *
		Bravo Ultrex 82.5% WDG	2.8-3.8 lb/A	Shuck split *
		Equus 720 54% L	3.1-4.1 pt/A	Shuck split *
		Equus DF 82.5% DF	2.2-3.5 lb/A	Shuck split *
Bacterial canker, coryneum blight, brown rot	Copper hydroxide	Champion WP 77% WP	8-16 lb/A	Apply at leaf fall or as a dormant spray.
		Champ Formula 2 37.5% L	5.3-8 pt/A	Apply at leaf fall or as a dormant spray.
		3 lb Copper 37.5% L	1.33-4 pt/ 100 gal	Do not apply after bloom.
		KOP-Hydroxide 37.5% L	2.7-4 pt/ 100 gal	Do not apply after bloom.
		KOP-Hydroxide 50W 77% WP	8-12 lb/A	Do not apply after bloom.
Blossom blight, shot hole	Copper hydroxide	Kocide DF 61.4% DF	8-12 lb/A	Do not apply after bloom.
		Kocide 4.5 LF 37.5% L	5.3-8 pt/A	Do not apply after bloom.
		Kocide 101 77% WP	8-12 lb/A	Do not apply after bloom.
		Nu-Cop 50 DF 77% DF	8-12 lb/A	Do not apply after bloom.
		Nu-Cop 3L 37.5%L	1.3-4 pt/A	Do not apply after bloom.
	Basic copper sulfate	Basic Copper "53" 98% WP	14-20 lb/A	Do not apply when trees are in leaf.
		Basicop 53% WP	4-5 lb/100 gal	Do not apply when trees are in leaf.
		Cuprdix Disperss 36.9% WP	10-16 lb/A	Apply dormant or at full bloom.
	Basic copper sulfate + sulfur	Top Cop with Sulfur 8.4%+50% L	2-4 qt/100 gal	Do not apply when trees are in leaf.
	Ziram	Ziram Granuflo 76% WDG	6-8 lb/A	30.* Limit 40 lb/A/season
		Ziram 76 DF 76% DF	6 lb/A	30.* Limit 30 lb/A/season
	Copper oxychloride + basic copper sulfate	C-O-C-S WDG 74.8+14.2% WDG	5-12 lb/A	Do not apply after petal fall.
	Copper ammonium complex	Copper-Count-N 8% L	8-12 qt/A	Do not apply after bloom.

## APRICOT (continued)

Disease	Chemical	Formulation	Rate	Remarks
Brown rot	Captan	Captan Wettable Powder 50% WP	3-5 lb/A	0.* Limit 25 lb/A/season
		Captan 4 L 37.6% L	1.5-2.5 qt/A	0.* Limit 12.5 qt/A
		Captan 50 W 50% WP	3-5 lb/A	0.* Limit 25 lb/A/season
		Captan 80 W 80% WP	1.9-3.12 lb/A	0.* Limit 15.6 lb/A/season
		Captec 4 L 38.2% L	2-2.5 qt/A	0.* Limit 12.5 qt/A/season
	Propiconazole	Orbit 41.8% L	4 oz/A	0.* Limit 2 preharvest sprays. Limit 12 oz from early bloom through petal fall.
		Propi Max EC 41.8% EC	4 oz/A	0.* Limit 2 preharvest sprays. Limit 12 oz from early bloom through petal fall.
	Fenhexamid	Elevate 50% WDG	1-1.5 lb/A	0.* Limit 6 lb/A/season
	Fenbuconazole	Indar 75 WSP 75% WSP	2 oz/A	0.* Limit 1 lb/A/season
Thiophanate methyl	Topsin M 70 WP 70% WP	1-1.5 lb/A	1.* See resistance management section.	
	T-Methyl 70 W WSB 70% WP	1.5 lb/A	1.* See resistance management section.	
Phytophthora crown and root rot	Mefenoxam	Ridomil Gold EC 49% L	2 qt/treated A	Limit 3 applications/year
Blossom blight, shot hole, scab	Iprodione	Rovral Brand 4 41.6% L	1-2 pt/A	Do not apply after petal fall. Limit 2 applications/season.
		Iprodione 4 L AG 41.6% L	1-2 pt/A	Do not apply after petal fall. Limit 2 applications/season.
Brown rot, powdery mildew, shot hole	Myclobutanil	Nova 40 W 40% WSP	2.5-6 oz/A	0.* Limit 2.75 lb/A/season
Brown rot, powdery mildew, shot hole, scab, leaf rust, anthracnose	Azoxystrobin	Abound 22.9% L	11-15.4 oz/A	0.* Limit 4 applications/season at high rate
Brown rot, powdery mildew, scab, shot hole, anthracnose	Pyraclostrobin + boscalid	Pristine 12.8 + 25.2% WG	10.5-14.5 oz/A	0.* Limit 5 applications/season
Brown rot, blossom blight	Cyprodinil	VanguardWG 75% W SG	5 oz/A	Limit 2 applications/A/season
Brown rot, Rhizopus rot	Dicloran	Botran 75 W 75% WP	1.3-5.3 lb/A	10.* Apply 18 and 10 days before harvest.
		Allisan 75% WP	1 lb/100 gal	Post-harvest spray
Brown rot, Botrytis, Rhizopus, Gilbertella rot	Fludioxonil	Scholar 50% WP	8-16 oz/100 gal	Post-harvest treatment. Treats 200,000 lb.
Powdery mildew, scab	trifloxystrobin	Flint 50% WDG	2-4 oz/A	1.* Limit 4 applications/season



## BLACKBERRY, RASPBERRY

Disease	Chemical	Formulation	Rate	Remarks
Leafspot, cane spot	Copper hydroxide	Kocide 101 77% WP	2-4 lb/A	Apply delayed dormant or after harvest
		Kocide DF 61.4% DF	2-4 lb/A	Apply delayed dormant or after harvest
		Kocide 4.5 LF 37.5% L	1.3-2.6 pt/A	Apply delayed dormant or after harvest
		3 lb Copper 37.5% L	2.66-5.33 pt + 1 qt superior-type oil/100 gal	Apply delayed dormant or after harvest. Could apply late spring at 2.66 pt rate.
		Nu-Cop 50 DF 77% DF	2-4 lb/A + 1 qt superior-type oil	Apply delayed dormant or after harvest.
		Nu-Cop 3 L 37.5% L	2.6-5.3 pt + 1 qt superior-type oil/100 gal	Apply delayed dormant or after harvest. Could apply late spring at 2.66 pt rate on blackberry.
		KOP-Hydroxide 37.5% L	2.6-5.3 pt + 1qt superior-type oil/100 gal	Apply delayed dormant and/or after harvest. Not cleared on raspberry
		KOP-Hydroxide 50 77% WP	4 lb/A	Add 1 qt crop oil/A. Apply delayed dormant and in fall.
Botrytis fruit rot	Mnclozolin	Ronilan DF 50% DF	1-2 lb/A	9.* Limit 8 lb/A/season. Not cleared on blackberry.
		Iprodione	Rovral Brand 4 41.6% L	1-2 pt/A
	Fenhexamid	Iprodione 4 L AG 41.6% L	1-2 pt/A	0.* Limit 4 applications/season
		Elevate 50% WDG	1.5 lb/A	0.* Limit 6 lb/A product/season
		Phytophthora root rot	Fosethyl-Al	Aliette WDG 80% WDG
	Mefenoxam	Ridomil Gold EC 49%L	0.25 pt/1000 linear ft on a 3-ft band	45.* Not cleared on blackberry
Anthracnose, leaf spot, yellow rust	Basic copper sulfate	Basicop 53% WP	2 lb/100 gal	0*
		Basic Copper "53" 98% WP	4-5 lb/A	0*
		Cuprifix Disperss 36.9% WP	2.5-6 lb/A	0*
	Basic copper sulfate + sulfur	Top Cop with Sulfur 8.4 + 50% L	2 qt/A	0.* Not cleared on blackberry
	Copper salts of fatty and rosin acids	Tenn-Cop 5 E 58% L	4-6 pt/A	0*

## BLACKBERRY, RASPBERRY (continued)

Disease	Chemical	Formulation	Rate	Remarks
Anthraco nose, leaf and cane spot, yellow rust	Copper ammonium complex	Copper-Count-N 8% L	2-4 qt/A	0.*
Leaf and cane spot, yellow rust	Copper oxychloride + basic copper sulfate	C-O-C-S WDG 74.8% + 14.2% WDG	4-6 lb/A	Apply early-season and post-harvest
Leaf spot, powdery mildew, rust, Anthracnose, Botrytis suppression	Pyraclostrobin	Cabrio EG 20% WDG	14 oz/A	0.* Limit 4 applications/season
Anthraco nose, Botrytis, leaf spot, rust	Pyraclostrobin + Boscalid	Pristine 12.8 + 25.2% WG	18.5-23 oz/A	0.* Limit 4 applications/season
Yellow rust	Calcium polysulfide	Lime Sulfur Solution 29% L	5-8 gal/100 gal	Apply as dormant spray
Powdery mildew	Sulfur	Sulfur 6 L 52% L	2.5 gal/A	0*
		Microspere Wettable Sulfur 90% WP	15 lb/A	0*
		Microthiol Disperss 80% WP	6-15 lb/A	0*
		Sulfur Flowable 6 52% L	2.5 gal/A	0*
		MicroSulf 80% WP	6-15 lb/A	0*
		Sulfur 90 W 90% WP	6-15 lb/A	0*
Rust, powdery mildew	Myclobutanil	Nova 40 W 40% WSP	1.25-2.5 oz/A	0.* Do not apply more than 10 oz/A/season.

## BLUEBERRY

Disease	Chemical	Formulation	Rate	Remarks
Mummyberry, Botrytis blossomblight	Captan	Captan 50 Wettable Powder 50% WP	5 lb/A	0.* Limit 70 lb/A/season
		Captan 50 W 50% WP	5 lb/A	0.* Limit 70 lb/A/season
		Captan 80 WP 80% WP	3.12 lb/A	0.* Limit 43.75 lb/A/season
		Captec 4 L 38.2% F	2.5 qt/A	0.* Limit 35 qt/A/season
		Captan 4 L 37.6% L	2.5 qt/A	0.* Limit 35 qt/A/season
Botrytis	Iprodione	Rovral Brand 4 41.6% L	1-2 pt/A	0.* Limit 4 applications/season
		Iprodione 4 L 41.6% L	1-2 pt/A	0.* Limit 4 applications/season
	Fenhexamid	Elevate 50% WDG	1.5 lb/A	0.* Limit 6 lb/A product/season
Botrytis, mummyberry, Anthracnose	Fenhexamid + Captan	Captevate 68 WDG 14.3 + 54.8% WDG	3.5-4.7 lb/A	0.* Limit 2 lb/A/season

## BLUEBERRY (continued)

Disease	Chemical	Formulation	Rate	Remarks
Mummyberry, Phomopsis, Botrytis, anthracnose fruit rot	Ziram	Ziram 76 DF 76% DF	3 lb/A	Do not apply after 3 weeks past full bloom.
		Ziram Granuflo 76% WDG	3 lb/A	Do not apply after 3 weeks past full bloom.
Phytophthora root rot	Mefenoxam	Ridomil Gold EC 49% L	3.6 pt/A	Limit 2 applications/season
	Fosethyl-Al	Aliette WDG 80% WDG	5 lb/A	0*. Limit 4 applications/season
Mummyberry, Alternaria, Phomopsis, Anthracnose	Azoxystrobin	Abound 22.9% L	6.2-15.4 oz/A	0.* Limit 3 applications/season
Mummyberry, Anthracnose	Chlorothalonil	Equus 720 54% L	3-4 pt/A	42.* Do not apply after early bloom.
		Equus DF 82.5 % DF	2.7-3.6 lb/A	42.* Do not apply after early bloom.
		Bravo Weather Stik 54% F	3-4 pt/A	42.* Do not apply after early bloom.
		Bravo Ultrex 82.5% WDG	2.7-3.6 lb/A	42.* Do not apply after full bloom.
		Echo 720 54% L	3-4 pt/A	42.* Do not apply after early bloom.
		Echo 90 DF 90% DF	2.5-3.2 lb/A	42.* Do not apply after early bloom.
Fruit rot, Phomopsis twig blight	Copper hydroxide	Kocide DF 61.4% DF	3-5 lb/A	Late dormant application and before blooms open
		Kocide 101 77% WP	3-5 lb/A	Late dormant application and before blooms open
		Kocide 4.5 LF 37.5% L	4 pt/A	Late dormant application and before blooms open
Cane canker	Copper ammonium complex	Copper-Count-N 8% L	8-10 qt/A	0.*
Phomopsis, powdery mildew, rust, leaf spot, Anthracnose, Botrytis and mummyberry suppression only	Pyraclostrobin	Cabrio EG 20% WDG	14 oz/A	0.* Limit 4 applications/season
Phomopsis, powdery mildew, rust, leaf spot, Botrytis, anthracnose	Pyraclostrobin + Boscalid	Pristine 12.8 + 25.2% WG	18.5-23 oz/A	0.* Limit 4 applications/season
Powdery mildew	Sulfur	Sulfur 6 L 52% L	2.5 gal/A	0.*
		Sulfur Flowable 6 52% F	1.0 gal/A	0.*
		Microspere Wetttable Sulfur 90% WP	15 lb/A	0.*
		Microthiol Disperss 80% WP	6-15 lb/A	0.*
		MicroSulf 80% WP	6-15 lb/A	0.*
		Sulfur 90 W 90% W	6-15 lb/A	0.*

## GRAPE

Disease	Chemical	Formulation	Rate	Remarks
Phomopsis, downy mildew suppression, black rot	Captan	Captan 50 Wettable Powder 50% WP	2-4 lb/A	0.* Limit 24 lb/A/season
		Captan 80 WP 80% WP	1.25-2.5 lb/A	0.* Limit 15 lb/A/season
		Captec 4 L 38.2% L	1-2 qt/A	0.* Limit 12 qt/A/season
		Captan 50 W 50% WP	2-4 lb/A	0.* Limit 24 lb/A/season
		Captan 4 L 37.6% L	1-2 qt/A	0*
Black rot, powdery mildew, downy mildew	Copper hydroxide	Kocide 101 77% WP	2-4 lb/A	0.* Some varieties are copper sensitive.
		Kocide DF 61.4% DF	2-4 lb/A	0.* Some varieties are copper sensitive.
		Kocide 4.5 LF 37.5% L	1.3-2.6 pt/A	0.* Some varieties are copper sensitive.
		3 lb Copper 37.5% L	1.33-2.66 pt/A	0.* Some varieties are copper sensitive.
		Nu-Cop 50 DF 77% DF	2 lb+1-3 lb hydrated lime/A	0.* Some varieties are copper sensitive.
		Nu-Cop 3 L 37.5% L	1.3-2.6 pt/A	0.* Some varieties are copper sensitive.
		KOP-Hydroxide 37.5% L	2.7 pt + 2.6 lb hydrated lime/A	0.* Some varieties are copper sensitive.
		KOP-Hydroxide 50 77% WP	2 lb/A	0.* Some varieties are copper sensitive.
		Champ Formula 2 37.5% L	1.33-2.66 pt/A	0.* Some varieties are copper sensitive.
		Champion WP 77% WP	2-4 lb/A	0.* Some varieties are copper sensitive.
	Copper oxychloride + basic copper sulfate	C-O-C-S WDG 74.8% + 14.2% WDG	2 lb/A	Some varieties are copper sensitive.
Black rot, powdery mildew, anthracnose	Myclobutanil	Nova 40 W 40% WSP	3-5 oz/A	14.* Limit 1.5 lb/A/season
Black rot, bitter rot, powdery mildew, Phomopsis	thiophanate methyl	Topsin M 70 WP 70% WP	0.75-1.5 lb/A	14.*
Botrytis bunch rot	Iprodione	Rovral Brand 4 41.6% L	1-2 pt/A	7.* Limit 4 applications/season for wine grapes and 1 application for table grapes
		Iprodione 4 L 41.6% L	1-2 pt/A	7.* Limit 4 applications/season for wine grapes and 1 application for table grapes
	Cyprodinil	Vanguard WG 75% WG	5-10 oz/A	7.* Limit 20 oz/A/season
	Fenhexamid	Elevate 50% WDG	1 lb/A	0.* Limit 3 lb/A/season
Powdery mildew	Fenarimol	Rubigan EC 12% L	2-6 oz/A	30.* Limit 19 oz/A/season
	Triflumizole	Procure 50 WS 50% WS	4-8 oz/A	7.* Limit 32 oz/A/season

## GRAPE (continued)

Disease	Chemical	Formulation	Rate	Remarks
Powdery mildew (continued)	Sulfur (continued)	Liquid Sulfur Six 52% L	1-2 pt/100 gal	0*
		Sulfur 6L 52% L	7 pt-1 gal/A	0.* Some varieties are sensitive.
		Microspere Wettable Sulfur 90% WP	5-6 lb/A	0.* Some varieties are sensitive.
		Sulfur 90 W 90% WP	2-8 lb/A	0.* Some varieties are sensitive.
		That Flowable Sulfur 52% L	1-2 pt/100 gal	0.* Limit 5 applications
		Microthiol Disperss 80% WP	3-10 lb/A	v Some varieties are sensitive.
		EM-53 Red Ball 53% L	1-2 pt/100 gal	0*
Powdery mildew, Phomopsis	Sulfur	Sulfur Flowable 6 52% L	7 pt-1 gal/A	0.* Some varieties are sensitive.
		MicroSulf 80% WP	3-10 lb/A	0.* Some varieties are sensitive.
Powdery mildew, black rot	Triadimefon	Bayleton DF 50% DF	2-6 oz/A	14.* Limit 18 oz/A/season
	Tebuconazole	Elite 45 DF 45% DF	4 oz/A	14.* Limit 2 lb/A/season
Powdery mildew, Botrytis	Boscalid	Endura 70% WG	4.5-8 oz/A	14.* Limit 5 applications/season
Downy mildew	Mefenoxam + mancozeb	Ridomil Gold MZ 4% + 64% WP	2.5 lb/A	66.* Limit 4 applications/season
	Mefenoxam + copper hydroxide	Ridomil Gold Copper 5%+60% WP	2 lb/A	66.* Limit 4 applications/season
	Fosethyl-Al	Aliette WDG 80% WDG	3-5 lb/A	15.* Supplemental label
Black rot, powdery mildew, downy mildew	Trifloxystrobin	Flint 50% WDG	1.5-4 oz/A	14.* Limit 8 oz/A/season and 3 consecutive applications. Do not apply to Concord.
	Kresoxim- methyl	Sovran 50 % WDG	3.2-6.4 oz/A	14.* Limit 25.6 oz/A/season
Powdery mildew, downy mildew, black rot, Phomopsis cane and leaf spot	Azoxystrobin	Abound 22.9% L	11-15.4 oz/A	14.* Limit 6 applications/A/season
Anthracnose, black rot, bunch rot, downy mildew, Phomopsis, powdery mildew, ripe rot, Botrytis suppression only	Pyraclostrobin + Boscalid	Pristine 12.8 + 25.2% WG	6-12.5 oz/A	14.* Limit 6 applications/season
Anthracnose, black rot, downy mildew	Basic copper sulfate	Basicop 53% WP	2 lb/100 gal	14*
		Basic Copper "53" 98% WP	4-5 lb/A	0.* Some varieties are sensitive.

## GRAPE (continued)

Disease	Chemical	Formulation	Rate	Remarks
Anthraxnose, black rot, downy mildew (continued)	Basic copper sulfate (continued)	Cuprdix Disperss 36.9% WP	2.5-6 lb/A	0.* Some varieties are sensitive.
Downy mildew, powdery mildew, bunch rot	Basic copper sulfate + sulfur	Top Cop with Sulfur 8.4 + 50% L	2 qt/A	0*
Black rot, bunch rot, deadarm, downy mildew	Maneb + zinc	Manex 37% L	1.2-3.2 qt/A	66.* Limit 19.2 qt/A/season
	Maneb	Maneb 75 DF 75% DF	1.5-4 lb/A	66.* Limit 25.6 lb/A/season
		Maneb 80 WP 80% WP	1.5-4 lb/A	66.* Limit 24 lb/A/season
	Mancozeb	Dithane DF 75% DF	1.5-4 lb/A	66.* Limit 25.6 lb/A/season
		Dithane F 45 37% L	1.2-3.2 qt/A	66.* Limit 19.2 qt/A/season
		Dithane M-45 80% WP	1.5-4 lb/A	66.* Limit 24 lb/A/season
		Manex II 37% L	1.2-3.2 qt/A	66.* Limit 19.2 qt/A/season
		Manzate 75 DF 75% DF	1.5-4 lb/A	66.* Limit 24 lb/A/season
	Penncozeb 75 DF 75% DF	1.5-4 lb/A	66.* Limit 25.6 lb/A/season	
Penncozeb 80 WP 80% WP	1.5-4 lb/A	66.* Limit 24 lb/A/season		
Black rot, downy mildew, powdery mildew, Phomopsis	Mancozeb + copper hydroxide	ManKocide 15%+46.1% DF	2.5 lb/A	66*
Black rot, downy mildew, Phomopsis cane and leafspot, ripe rot	Ziram	Ziram 76 DF 76% DF	3-4 lb/A	21.* Limit 28 lb/A/season
		Ziram Granuflo 76% WDG	3-4 lb/A	21.* Limit 28 lb/A/season
Downy mildew, powdery mildew, black rot suppression	Copper salts of fatty and rosin acids	Tenn-Cop 5 E 58% L	1.5-4.5 pt/A	0.* Some varieties are sensitive.
Black rot, anthracnose, powdery mildew and downy mildew	Copper ammonium complex	Copper-Count-N 8% L	2 qt/A	0.* Some varieties are sensitive.
Black rot	Ferbam	Ferbam Granuflo 76% WP	4 lb/A	7.* Limit 3 applications/season

## MAYHAW

Disease	Chemical	Formulation	Rate	Remarks
Scab, sooty blotch, fly speck, powdery mildew, bitter rot	Trifloxystrobin	Flint 50% WDG	2-3 oz/A	14.* Limit 11 oz/A/season and 3 consecutive applications
Scab, powdery mildew, rust suppression	Kresoxim-methyl	Sovran 50% WDG	4-6.4 oz or 1-1.6 oz/100 gal	30.* Limit 25.6 oz/A/season
Rust, scab, powdery mildew	Myclobutanil	Nova 40 W 40% WSP	1.25-2.5 oz/100 gal or 2.5-5 oz/A	14.* Do not apply more than 5 lb/A/season.
Fire blight	Fosethyl-Al	Aliette WDG 80% WDG	2.5-5 lb/A	Apply before or during bloom.

## PEACH, PLUM, NECTARINE

Disease	Chemical	Formulation	Rate	Remarks
Brown rot, peach scab, plum black knot, powdery mildew	Thiophanate methyl	Topsin M 70 WP 70% WP	1-1.5 lb/A	1.* See resistance management section on label.
		T-Methyl 70 W WSB 70% WP	1.5-2.25 lb/A	1.* See resistance management section on label.
Brown rot, Rhizopus rot	Dicloran	Botran 75 W 75% WP	1.3-5.3 lb/A	10.* Make 2 preharvest applications. Not cleared on plums for preharvest.
		Allisan 75% WP	1-2.3 lb/A	Post-harvest treatment
Scab, leaf curl, coryneum blight, blossom blight black knot on plum	Chlorothalonil	Bravo Weather Stik 54% F	3.1-4.1 pt/A	Shuck split*
		Bravo Ultrex 82.5% WDG	2.8-3.8 lb/A	Shuck split*
		Echo 720 54% L	3.12-4.12 pt/A	Shuck split*
		Echo 90 DF 90% DF	2.2-3.5 lb/A	Shuck split*
		Equus 720 54% L	3.1-4.1 pt/A	Shuck split*
		Equus DF 82.5 % DF	2.8-3.8 lb/A	Shucksplit*
Brown rot, scab, coryneum blight	Captan	Captan 50 Wettable Powder 50% WP	4-8 lb/A	0.* Limit 48, 54, 64 lb/A/season for nectarines, plums and peaches, respectively
		Captan 80 WP 80% WP	2.5-5 lb/A	0.* Limit 30, 33, 40 lb/A/season for nectarines, plums and peaches, respectively
		Captec 4 L 38.2 % F	2-4 qt/A	0.* Limit 24, 27, 32 lb/A/season for nectarines, plums and peaches, respectively
		Captan 50 W 50% WP	4-8 lb/A	0.* Limit 48, 54, 64 lb/A/season for nectarines, plums and peaches, respectively
		Captan 4 L 37.6% L	2-4 qt/A	0.* Limit 24, 27, 32 qt/A/season for nectarines, plums and peaches, respectively
Brown rot, leaf spot, powdery mildew, rust	Tebuconazole	Elite 45 DF 45% DF	4-8 oz/A	0.* Limit 3 lb/A/season. Not cleared on plums
Brown rot, scab	Fenbuconazole	Indar 75 WSP 75% WSP	2 oz/A	0.* Limit 1 lb/A/season. Not cleared on plums
	Iprodione	Rovral Brand 4 41.6% L	1-2 pt/A	Limit 2 applications/season. Do not apply after petal fall.
		Iprodione 4 L AG 41.6% L	1-2 pt/A	Limit 2 applications/season. Do not apply after petal fall.
Bacterial spot, peach leaf curl, brown rot blossom blight, black knot on plum	Copper hydroxide (Use primarily as a dormant treatment - no active leaves on tree)	Kocide 101 77% WP	8-16 lb/A	21.* Apply as a dormant spray. For bacterial spot on peaches and nectarines, use 1 lb/A at first and second cover sprays.

## PEACH, PLUM, NECTARINE (continued)

Disease	Chemical	Formulation	Rate	Remarks
Bacterial spot, peach leaf curl, brown rot blossom blight, black knot on plum (continued)	Copper hydroxide (continued)	Kocide DF 61.4% DF	8-16 lb/A	21.* Apply as a dormant spray. For bacterial spot on peaches and nectarines, use 1 lb/A at first and second cover sprays.
		Kocide 4.5 LF 37.5% L	5.3-10.6 pt/A	21.* Apply as a dormant spray. For bacterial spot on peaches and nectarines, use 0.6 pt/A at first and second cover sprays.
		3 lb Copper 37.5% L	0.66-2.66 gal/A	21.* Apply as a dormant spray. For bacterial spot on peaches and nectarines, use 0.66 pt/A at first and second cover sprays.
		Nu-Cop 50 DF 77% DF	8-16 lb/A	21.* Apply at leaf fall or as a dormant spray. For bacterial spot on peaches and nectarines, use 1 lb/A at first and second cover sprays.
		Nu-Cop 3 L 37.5% L	0.6-2.6 gal/A	21.* Apply at leaf fall or as a dormant spray. For bacterial spot on peaches and nectarines, use 0.6 pt/A at first and second cover sprays.
		KOP- Hydroxide 37.5% L	10.66-21.3 pt/A	21.* Apply at leaf fall or as a dormant spray. Not cleared on plums. For bacterial spot, use 0.33 pt/100 gal at first and second cover sprays.
		KOP-Hydroxide 50W 77% WP	8-16 lb/A	21.* Apply at leaf fall or as a dormant spray. For bacterial spot, use 1 lb/A at first and second cover sprays.
		Champion WP 77% WP Champ Formula 2 37.5% L	8-16 lb/A 5.3-10.66 pt/A	Apply at leaf fall or as a dormant spray. Apply at leaf fall or as a dormant spray
Bacterial spot, leaf curl, brown rot blossom blight	Copper oxychloride + basic copper sulfate	C-O-C-S WDG 74.8%+14.2% WDG	12-16 lb/A	Apply at bloom and dormant stages.
		Basic copper sulfate	Cuprifix Disperss 36.9% L	2-15 lb/A
	Copper salts of fatty and rosin acids	Basicop 53% WP	4-5 lb/100 gal	Apply as a dormant spray/-pink bud.
		Basic Copper "53" 98% WP	16-25 lb/A	Apply as a dormant spray. For black knot on plum, add hydrated lime. See label.
		Tenn-Cop 5E 58% L	6-9 qt/A	Do not apply after full bloom. For bacterial spot post bloom use 0.25 pt/100 gal. Not cleared on plums.
Copper ammonium complex	Copper-Count-N 8% L	8-12 qt/A	Do not apply after full bloom. For bacterial spot use 0.5 pt/100 gal post bloom.	
Brown rot, powdery mildew, rust	Myclobutanil	Nova 40 W 40% WSP	2.5-6.0 oz/A	0.* Limit 2.75 lb/A/season for plum, 3.25 for peach and nectarine.



## PEACH, PLUM, NECTARINE (continued)

Disease	Chemical	Formulation	Rate	Remarks
Brown rot	Propiconazole	Orbit 41.8% L	4 oz/A	0.* Limit 2 preharvest sprays. Limit 12 oz/A from early bloom through petal fall.
		PropiMax EC 41.8 % EC	4 oz/A	0.* Limit 2 preharvest sprays. Limit 12 oz/A from early bloom through petal fall.
	Fenhexamid	Elevate 50% WDG	1-1.5 lb/A	0.* Limit 6 lb/A/season
Brown rot blossom blight	Cyprodinil	Vanguard WG 75% WSG	5 oz/A	Limit 2 applications/A/season
Peach scab, brown rot, peach leaf curl	Ziram	Ziram 76 DF 76% DF	4.5-8 lb/A	14.* Limit 72 lb/A/season. Not cleared on plums
		Ziram Granuflo 76% WDG	3.75-8 lb/A	14.* Limit 72 lb/A/season. Not cleared on plums
Bacterial spot	Oxytetracycline	Mycoshield 31.5% WP	12 oz/100 gal	3 weeks.* Not cleared on plums.
		Fireman 31.1% WP	12 oz/100 gal	3 weeks.* Not cleared on plums.
	Dodine	Syllit 65 W 65% WP	2 lb+4 lb Captan 50 W/A	15.* Do not mix with solvent insecticide formulations. Must be mixed with Captan to prevent injury. Not cleared on nectarines and plums
Scab, powdery mildew, brown rot	Sulfur	Liquid Sulfur Six 52% L	0.66-3.5 pt/ 100 gal	0.* Discoloration may occur on mature nectarines.
		Sulfur 6L 52% L	0.75-5 gal/A	0.* Discoloration may occur on mature nectarines.
		Sulfur Flowable 6 52% F	0.75-5 gal/A	0*
		That Flowable Sulfur 52% L	0.66-3.75 pt/ 100 gal	0*
		EM-53 Red Ball 53% L	0.66-3.5 pt/ 100 gal	0.* Discoloration may occur on mature nectarines.
		Sulfur 90 W 90% WP	8-26 lb/A	0*
		MicroSulf 80% WP	10-20 lb/A	0.* Do not apply to apricots.
		Microthiol Disperss 80% WP	10-20 lb/A	0.* Do not apply to apricots.
		Microspere Wettable Sulfur 90% WP	30 lb/A	0*
Brown rot, powdery mildew	Basic copper sulfate + sulfur	Top Cop with Sulfur 8.4+50% L	0.5-1.88 qt/ 100 gal	0 *
Peach scab, brown rot, anthracnose, powdery mildew, shot hole, leaf rust	Azoxystrobin	Abound 22.9% L	11-15.4 oz/A	0.* Limit 4 applications/season
Brown rot, powdery mildew, scab, shot hole, anthracnose	Pyraclostrobin + Boscalid	Pristine 12.8 + 25.2% WG	10.5-14.5 oz/A	0.* Limit 5 applications/season

## PEACH, PLUM, NECTARINE (continued)

Disease	Chemical	Formulation	Rate	Remarks
Phytophthora crown and root rot	Mefenoxam	Ridomil Gold EC 49% L	2 qt/A	Limit 3 applications/year
Brown rot, leaf curl, scab, rhizopus rot	Thiram	Thiram Granuflo 75% WP	3.9-5.1 lb/A	7.* Peaches only.
Scab, powdery mildew	Trifloxystrobin	Flint 50% WDG	2-4 oz/A	1.* Limit 4 applications/season
Brown rot, Botrytis, Rhizopus, Gilbertella rot	Fludioxonil	Scholar 50% WP	8-16 oz/100 gal	Post-harvest treatment. Treats 200,000 lb.

## PEAR

Disease	Chemical	Formulation	Rate	Remarks
Scab, powdery mildew, fly speck, sooty blotch, fruit rots	Trifloxystrobin	Flint 50% WDG	2-3 oz/A	14.* Limit 11 oz/A/season and 3 consecutive applications
Fire blight	Copper hydroxide	Kocide 101 77% WP	1 lb/A	Apply through bloom period on 5-day intervals.
		Kocide DF 61.4% DF	1 lb/A	Apply through bloom period on 5-day intervals.
		Kocide 4.5 LF 37.5% L	0.6 pt/A	Apply through bloom period on 5-day intervals.
		3 lb Copper 37.5% L	0.66-1.33 pt/A	Apply during bloom period.
		Nu-Cop 50 DF 77% DF	1 lb/A	Apply during bloom period.
		Nu-Cop 3L 37.5% L	0.6-1.3 pt/A	Apply during bloom period.
		KOP-Hydroxide 37.5% L	0.33 pt/100 gal or 1.33 pt/A	Apply through bloom period.
		KOP-Hydroxide 50W 77% WP	1 lb/A	Apply through bloom period.
		Champion WP 77% WP	1 lb/A	Apply through bloom period.
		Champ Formula 2 37.5% L	0.66 pt/A	Apply through bloom period.
	Oxytetracycline	Mycoshield 31.5% WP	1 lb/100 gal (200 ppm spray solution)	60.* Some varieties are sensitive.
		Fireman 31.1% WP	1 lb/100 gal	60.* Some varieties are sensitive.
	Streptomycin sulfate	Agri-mycin 17 22.4% WP	24-48 oz/A	30*
		Streptrol 21.3% WP	24-48 oz/A	30*
AS-50 65.8% WP		8-16 oz/A	30*	
Basic copper sulfate	Basicop 53% WP	2-4 lb/A	Apply during bloom. Some varieties are sensitive.	
	Basic Copper "53" 98% WP	2 lb/A	Apply during bloom. Some varieties are sensitive.	
	Cuprifix Disperss 36.9% WP	1.25 lb/A	Apply during bloom.	

**PEAR (continued)**

<b>Disease</b>	<b>Chemical</b>	<b>Formulation</b>	<b>Rate</b>	<b>Remarks</b>
Fire blight (continued)	Mancozeb + copper hydroxide	ManKocide 15%+46.1% DF	1.5 lb/A	Apply during bloom stage.
	Copper oxychloride + basic copper sulfate	C-O-C-S WDG 74.8%+14.2% WDG	1-2 lb/A	Apply through bloom stage.
	Copper ammonium complex	Copper-Count-N 8% L	1-2 qt/A	Apply during bloom. Some varieties sensitive.
	Fosethyl-Al	Aliette WDG 80% WDG	2.5-5 lb/A	Apply before or during bloom.
Fire blight, Bulls eye rot	Basic copper sulfate + sulfur	Top Cop with Sulfur 8.4+50% L	2 qt/100 gal	3.* Apply during bloom and before harvest.
Scab	Cyprodinil	Vanguard WG 75% WG	3-5 oz/A	72.* Do not apply alone. Tank mix with another fungicide.
Rusts, scab, Fabrea leafspot	Mancozeb	Dithane DF 75% DF	3.2 lb/A	77.* Limit 22 lb/A/season
		Dithane M-45 80% WP	3 lb/A	77.* Limit 21 lb/A/season
		Dithane F-45 37% L	2-4 qt/A	77.* Limit 16.8 qt/A/season
		Manzate 75 DF 75% DF	3 lb/A	77.* Limit 21 lb/A/season
		Penncozeb 75 DF 75% DF	3 lb/A	77.* Limit 22.4 lb/A/season
		Penncozeb 80 WP 80% WP	3 lb/A	77.* Limit 21 lb/A/season
		Manex II 37% L	2.4 qt/A	77.* Limit 16.8 qt/A/season
Powdery mildew, scab	Sulfur	Microthiol Disperss 80% WP	10-20 lb/A	0.* Some varieties are sensitive.
		Sulfur 6L 52% L	1.5-5 gal/A	0*
		MicroSulf 80% WP	10-20 lb/A	0.* Some varieties are sensitive.
		Liquid Sulfur Six 52% L	0.75-3.5 pt/ 100 gal	0*
		Sulfur 90W 90% WP	8-26 lb/A	0.* Some varieties are sensitive.
		Sulfur Flowable 6 52% L	0.75-5 gal/A	0*
		Microspere Wettable Sulfur 90% WP	15-30 lb/A	0*
		That Flowable Sulfur 52% L	1-12 pt/100 gal	0*
Scab, powdery mildew, rust	Triflumizole	Procure 50 WS 50% WS	8-16 oz/A	14.* Limit 64 oz/A/season
	Fenarimol	Rubigan EC 12% L	8-12 oz/A	30.* Limit 84 oz/A/season. Do not apply until after petal fall.
	Ziram	Ziram 76 DF 76% DF	6-8 lb/A	14.* Limit 56 lb/A/season

## PEAR (continued)

Disease	Chemical	Formulation	Rate	Remarks
Scab, powdery mildew, rust (continued)	Ziram (continued)	Ziram Granuflo 76% WDG	6-8 lb/A	14.* Limit 56 lb/A/season
Scab, sooty blotch fruit spot, leaf spot	Ferbam	Ferbam Granuflo 76% WP	4-6 lb/A	7.*
Scab, powdery mildew, rust suppression	Kresoxim-methyl	Sovran 50% WDG	4-6.4 oz/A	30*
Powdery mildew	Triadimefon	Bayleton DF 50% DF	2-8 oz/A	45.* Limit 24 oz/A/season
Storage rots	Captan	Captan 50 Wettable Powder 50% WP	2.5 lb/100 gal	Post-harvest dip or spray
		Captan 4 L 38.2% L	1.25 qt/100 gal	Post-harvest dip or spray
		Captan 50 W 50% WP	2.5 lb/100 gal	Post-harvest dip or spray
		Captan 80 WP 80% WP	1.6 lb/100 gal	Post-harvest dip or spray
		Captan 4L 37.6% L	1.25 qt/100 gal	Post-harvest dip or spray
	Thiabendazole	Mertect 340-F 42.3% L	16 oz/100 gal	Post-harvest dip or spray
		Decco Salt No. 19 98.5% L	1-2 bags (575 g/bag)300 gal	Post-harvest dip or spray

## PECAN

Disease	Chemical	Formulation	Rate	Remarks
Scab, downy spot, powdery mildew, liver spot plus others	Thiophanate methyl	Topsin M 70 W 70% WP	0.5-1 lb/A	Do not apply after shuck split.
		T-Methyl 70 W WSB 70% WP	0.5-1 lb/A	Do not apply after shuck split.
Scab, anthracnose	Ziram	Ziram 76 DF 76% DF	6-8 lb/A	55.* Limit 64 lb/A/season. Do not graze livestock.
		Ziram Granuflo 76% WDG	6-8 lb/A	55.* Limit 64 lb/A/season. Do not graze livestock.
Scab, brown leaf spot, downy spot, powdery mildew, liver spot, leaf blotch, sooty mold	Triphenyltin hydroxide	Super Tin 80 WP 80% WP	5-7.5 oz/A	Do not apply after shuck split. Limit 10 applications/season. Closed cab only.
		Agri Tin 80% WP	5-7.5 oz/A	30.* Do not graze livestock. Limit 9 applications/season. Closed cab only.
Scab, vein spot, powdery mildew, leaf scorch, leaf blotch, downy spot, Gnomonia leafspot	Fenbuconazole	Enable 2 F 23.5% L	8 oz/A	28.* Do not apply after shuck split. Limit 1.5 qt/A/season. Do not graze livestock.
	Fenbuconazole + triphenyltin hydroxide	Enable/Agri Tin 75% WSP	1 co-pack/5A	30.* Do not apply after shucks have opened. Do not graze livestock.
Scab	Basic copper sulfate	Basicop 53% WP	2 lb/100 gal	Cleared on pecan, but not recommended in Texas
	Kreoxim-methyl	Sovran 50% WDG	2.4-4.8 oz/A	45.* Limit 6 applications/A/season

## PECAN (continued)

Disease	Chemical	Formulation	Rate	Remarks
Scab, brown leaf spot, downy spot, powdery mildew, liver spot, sooty mold, leaf blotch, vein spot, zonate leaf spot, fungal leaf spot	Propiconazole + triphenyltin hydroxide	Orbit 45 WP/Super Tin 80 WP 45% WP + 80% WP	20 oz/5A Orbit + 18.75 oz/5 A Super Tin	30.* Closed cab only. Do not graze livestock.
Scab, anthracnose	Azoxystrobin	Abound 22.9% L	6.2-12.3 oz/A	45.* Limit 6 applications/A/season
	Pyraclostrobin + Boscalid	Pristine 12.8 + 25.2% WG	10.5-14.5 oz/A	14.*
	Propiconazole + trifloxystrobin	Stratego 11.4 + 11.4% L	10 oz/A	30.* Limit 3 applications/season.
Scab, liverspot, brown leaf spot, downy spot, leaf blotch	Dodine	Dodine 65 W 65% WP	2-4 lb/A	Do not apply after shuck split. Some varieties are sensitive to injury. Do not graze livestock.
Scab, foliar diseases	Propiconazole	PropiMax 41.8% EC	4-6 oz/A	Do not apply after shuck split. Limit 4 applications/season. Closed cab only. Do not graze livestock.

## STRAWBERRY

Disease	Chemical	Formulation	Rate	Remarks
Botrytis, leafspot	Captan	Captan 50 Wettable Powder 50% WP	3-6 lb/A	0.* Limit 48 lb/A/season
		Captan 80 WP 80% WP	1.9-3.75 lb/A	0.* Limit 30 lb/A/season
		Captec 4 L 38.2% F	2-3 qt/A	0.* Limit 24 qt/A/season
		Captan 50 W 50% WP	3-6 lb/A	0.* Limit 48 lb/A/season
		Captan 4 L 37.6% L	1.5-2 qt/A	0.* Limit 6 gal/A/season
Leafspot, leaf blight	Copper hydroxide	Kocide 101 77% WP	2-3 lb/A	0*
		Kocide DF 61.4% DF	2-3 lb/A	0*
		Kocide 4.5 LF 37.5% L	1.3-2 pt/A	0*
		KOP-Hydroxide 37.5% L	2.7-4 pt/A	0*
		KOP-Hydroxide 50 77% WP	2-3 lb/A	0*
		Nu-Cop 50 DF 77% DF	2-3 lb/A	0*
		Champion WP 77% WP	2-3 lb/A	0*
		Champ Formula 2 37.5% L	1.3-2 pt/A	0*
Leafspot, leaf blight, downy mildew		3 lb Copper 37.5% L	1.33-4 pt/A	0*
		Nu-Cop 3 L 37.5% L	1.3-4 pt/A	0*

## STRAWBERRY (continued)

Disease	Chemical	Formulation	Rate	Remarks
Botrytis, leaf spot, Phomopsis, anthracnose (suppression)	Iprodione	Rovral Brand 4 41.6% L	1.5-2 pt/A	Limit 1 application/season. Do not apply after first fruiting flower.
		Iprodione 4L 41.6% L	1.5-2 pt/A	Limit 1 application/season. Do not apply after first fruiting flower.
Botrytis, leaf blight, leaf scorch	Thiophanate methyl	Topsin M 70 WP 70% WP	0.75-1 lb/A	1.* See resistance management section on label.
		T-Methyl 70 W WSB 70% WP	0.75-1 lb/A	1.* See resistance management section on label.
Red stele, leather rot (Phytophthora diseases)	Fosethyl-Al	Aliette WDG 80% WDG	2.5-5 lb/A (foliar) 2.5 lb/100 gal (dip)	0.* Limit 30 lb/A/season
	Mefenoxam	Ridomil Gold EC 49% L	1 pt/A	Limit 1.5 qt/A/season
Leafspot	Basic copper sulfate	Basicop 53% WP	2-3 lb/A	Apply pre-bloom and post-harvest.
		Cuprifix Disperss 36.9% WP	2.5-5 lb/A	0*
		Basic copper "53" 98% WP	2-3 lb/100 gal	0*
	Copper salts of fatty and rosin acids	Tenn-Cop 5 E 58% L	3-4 pt/A	0*
		Copper ammonium complex	Copper-Count-N 8% L	1.5-2 qt/A
Leafspot, bacterial blight	Copper oxychloride + basic copper sulfate	C-O-C-S WDG 74.8+14.2% WDG	2-4 lb/A	0*
Downy mildew	Basic copper sulfate + sulfur	Top Cop with Sulfur 8.4+50% L	2 qt/A	0*
Leafspot, scorch and blight	Dodine	Syllit 65 W 65% WP	1.5-2 lb/A	14*
Powdery mildew	Sulfur	Liquid Sulfur Six 52%	2 pt/100 gal	0*
		Sulfur 6 L 52% L	5.3-13 pt/A	0*
		Microperse Wettable Sulfur 90% WP	10 lb/A	0*
		Microthiol Disperss 80% WP	5-10 lb/A	0.* Some varieties are sensitive.
		EM-53 Red Ball 53% L	2 pt/A	0*
		Sulfur Flowable 6 52% F	5.33-13 pt/A	0*
		MicroSulf 80% WP	5-10 lb/A	0.* Some varieties are sensitive.
		Sulfur 90W 90% WP	5-10 lb/A	0.* Some varieties are sensitive.
		That Flowable Sulfur 52% L	1 pt/A	0*

## STRAWBERRY (continued)

Disease	Chemical	Formulation	Rate	Remarks
Powdery mildew (continued)	Triflumazole	Procure WS 50% WS	4-8 oz/A	1.* See plant back restrictions.
Botrytis	Thiram	Thiram 65 WSB 65% WP	4-5 lb/A	3.* Limit 5 applications/season
	Fenhexamid	Elevate 50% WDG	1.5 lb/A	0.* Limit 6 lb/A/season
	Cyprodinil + fludioxonil	Switch 62.5 WG 37.5 + 25% WG	11-14 oz/A	0.* Limit 56 oz/A/yr. Do not plant back to other crops for 12 months.
Botrytis, anthracnose	Fenhexamide + captan	Captevate 68 WDG 14.3 + 54.8% WDG	3.5-5.25 lb/A	0.* Limit 21 lb/A/season
Powdery mildew, leaf spot, leaf blight	Myclobutanil	Nova 40 W 40% WSP	2.5-5 oz/A	0*. Do not apply more than 36 oz/A/season. 30-day plant back restriction.
Anthracnose, leaf spot, powdery mildew, Botrytis suppression only	Pyraclostrobin	Cabrio EG 20% WDG	12-14 oz/A	0.* Limit 5 applications/season
Anthracnose, Botrytis, powdery mildew, leaf spot	Pyraclostrobin + Boscalid	Pristine 12.8 + 25.2 WG	18.5-23 oz/A	0.* Limit 5 applications/season
Anthracnose, powdery mildew	Azoxystrobin	Quadris 22.9% L	6.2-15.4 oz/A	0.*

## WALNUT

Disease	Chemical	Formulation	Rate	Remarks	
Walnut blight (bacterial blight)	Copper hydroxide	Nu Cop 50 DF 77% DF	8-12.5 lb/A	0*	
		Champion WP 77% WP	8-12.5 lb/A	0*	
		Champ Formula 2 37.5% L	5.33-8 pt/A	0*	
		3 lb Copper 37.5% L	5.33-17 pt/A	0*	
		KOP Hydroxide 37.5% L	10.66-16.66 pt/A	0*	
		KOP Hydroxide 50 W 77% WP	8-12.5 lb/A	0*	
		Kocide DF 61.4% DF	8-12 lb/A	0*	
		Kocide 4.5 LF 37.5% L	5.3-8.3 pt/A	0*	
		Kocide 101 77% WP	8-12 lb/A	0*	
		Nu-Cop 3 L 37.5% L	5.3-17 pt/A	0*	
		Copper ammonium complex	Copper-Count-N 8% L	8-12 qt/A	0.*
		Copper oxychloride + basic copper sulfate	C-O-C-S WDG 74.8%+14.2% WDG	12-16 lb/A	0*

## WALNUT (continued)

Disease	Chemical	Formulation	Rate	Remarks
Walnut blight (bacterial blight) (continued)	Basic copper sulfate	Basic Copper "53" 98% WP	12-25 lb/A	0*
	Basic copper sulfate	Cuprofix Disperss 36.9% WP	10-20 lb/A	0*
	(continued)	Basicop 53% WP	4-5 lb/100 gal	0*
	Basic copper sulfate + sulfur	Top Cop with Sulfur 8.4 + 50% L	1-3 qt/100 gal	0.* Apply until fruit set.
	Copper salts of fatty and rosin acids	Tenn-Cop 5 E 58% L	4 pt/100 gal	0*
Anthracnose, scab	Dodine	Syllit 65W 65% WP	4 lb/A	0.* Do not graze livestock.
	Azoxystrobin	Abound 22.9% L	11-12.3 oz/A	45*
	Trifloxystrobin	Flint 50% WDG	3-4 oz/A	60*
	Pyraclostrobin + Boscalid	Pristine 12.8 + 25.2% WG	10.5-14.5 oz/A	14.*



## TRADE NAMES AND COMPANIES

Product	Company	Product	Company
3 lb Copper	Helena	Liquid Sulfur Six	Helena
Abound	Syngenta	Maneb 75 DF	Cerexagri
Agri-mycin 17	Syngenta	Maneb 80 WP	Cerexagri
Agri Tin	Nufarm Americas	Manex	Griffin
Alliette WDG	Bayer Crop Science	Manex II	Griffin
Allisan	Gowan	ManKocide	Griffin
AS-50	Syngenta	Manzate 75 DF	Griffin
Basicop	Griffin	Mertect 340-F	Syngenta
Basic Copper "53"	Albaugh, Inc.	Micro Sulf	Nufarm Americas
Bayleton DF	Bayer Crop Science	Microspurse Wettable Sulfur	Micro Flo
Botran 75 W	Gowan	Microthiol Disperss	Cerexagri
Bravo Ultrex	Syngenta	Mycoshield	Syngenta
Bravo Weather Stik	Syngenta	Nova 40 W	DowAgro Sciences
C-O-C-S WDG (clean crop)	UAP	Nu-Cop 50 DF	Albaugh, Inc.
Cabrio	BASF	Nu-Cop 3L	Albaugh, Inc.
Captan 50 W	Drexel	Orbit	Syngenta
Captan 4 L	Drexel	Orbit 45 WP/Super Tin 80 WP	Griffin
Captan 50 Wettable Powder	Micro Flo	Penncozeb 75 DF	Cerexagri
Captan 80 WP	Micro Flo	Penncozeb 80 WP	Cerexagri
Captec 4 L	Micro Flo	Polyram 80 DF	UAP
Captevate 68 WDG	Arvesta	Pristine	BASF
Champion WP	Nufarm Americas	Procure 50 WS	Crompton
Champ Formula 2	Nufarm Americas	PropiMax EC	DowAgro Sciences
Copper-Count-N	Mineral Res. & Development	Quadris	Syngenta
Cuprofix Disperss	Cerexagri	Ridomil Gold MZ	Syngenta
Decco Salt No. 19	Cerexagri	Ridomil Gold EC	Syngenta
Dithane DF	DowAgro Sciences	Ridomil Gold Copper	Syngenta
Dithane F-45	DowAgro Sciences	Ronilan DF	BASF
Dithane M-45	DowAgro Sciences	Rovral Brand 4	Bayer Crop Science
Dodine 65 W	UAP	Rubigan EC	Gowan
Echo 90 DF	Sipcam Agro	Scholar	Syngenta
Echo 720	Sipcam Agro	Sovran	BASF
Elite 45 DF	Bayer Crop Science	Stratego	Bayer Crop Science
EM-53 Red Ball	International Sulfur	Streptrol	Nufarm Americas
Enable 2 F	DowAgro Sciences	Sulfur 6L	Micro Flo
Enable/ AgriTin	DowAgro Sciences	Sulfur 90W	Drexel
Endura	BASF	Sulfur Flowable 6	UAP
Elevate	Arvesta	Super Tin 80 WP	Griffin
Equus 720	Griffin	Switch 62.5 WG	Syngenta
Equus DF	Griffin	Syllit 65W	UAP
Ferbam Granuflo	Taminco	Tenn-Cop 5 E	Griffin
Fireman	Nufarms Americas	That Flowable Sulfur	Stoller
Flint	Bayer Crop Science	Thiram 65 WSB	Taminco
Indar 75 WSP	DowAgro Sciences	Thiram Granuflo	Taminco
Iprodione 4 L AG	Micro Flo	T-Methyl 70 W WSB	Micro Flo
Kocide 101	Griffin	Top Cop with Sulfur	Stoller
Kocide DF	Griffin	Topsin M 70 WP	Cerexagri
Kocide 4.5 LF	Griffin	Vanguard WG	Syngenta
KOP-Hydroxide	Drexel	Ziram 76 DF	Cerexagri
KOP-Hydroxide 50	Drexel	Ziram Granuflo	Taminco
Lime Sulfur Solution	UAP		

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Revision