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GUIDE FOR THE CHEMICAL CONTROL OF WOODY ORNAMENTAL AND FLOWER DISEASES

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Chemicals play an important part in the prevention of ornamental and flower diseases. They do not take the place of cultural control methods, but should be used to complement them.

Fungicidal chemicals should be used to protect shrubs and flowers against diseases. This protection is accomplished by either preventing a disease-causing organism from becoming established or by killing one that is already established. Because they are subject to weathering, fungicides must be reapplied uniformly to all susceptible plant parts at regular intervals as long as the danger of plant disease exists.

In every instance the manufacturers label should be read carefully and attention should be directed particularly to the safety measures listed on the label regarding mixing, handling, and applying fungicides. It is always essential that the user familiarize himself with the antidote given on the label.

Additional information on cause and symptoms of common ornamental diseases may be found in Virginia Extension Division leaflets in the control series. Copies of these leaflets can be obtained from the county cooperative extension office.

PLANT	DISEASE	FUNGICIDE AND FORMULATION	ACTIVE INGREDIENT	RATE	REMARKS
Ajuga	<u>Sclerotium</u> rot	Terraclor (75% WP)	PCNB	1 lb./100 sq. ft.	Drench plants in affected areas to prevent spread.
Azalea (Rhododendron)	<u>Exobasidium</u> leaf and flower gall	Dithane Z-78 (75% WP)	Zineb	2 lb./100 gal. water	Use before buds open and again after flowering. See Control Series 119.
		<u>Ovulinia</u> petal blight	Fore (80% WP) or Dithane Z-78 (75% WP)	Zinc ion and maneb Zineb	1-1/2 lb./100 gal. water (1-1/2 tbs./gal.) 1 lb./100 gal. water (2 tsp./gal. water)

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PLANT	DISEASE	FUNGICIDE AND FORMULATION	ACTIVE INGREDIENT	RATE	REMARKS
	<u>Cylindrocladium</u> root rot	Benlate (50% WP)	Benomyl	1 lb./100 gal. water (1 tbs./gal. water)	Drench the fungicide on the surface of growing medium as soon as the disease is diagnosed. Follow with a second application 14-days later.
Azalea (Cont'd)	Leaf spots. See ovulinia petal blight above				Spray in the spring after the new leaves appear and repeat at 2-week intervals during the growing season.
	<u>Phytophthora</u> root and crown rot	Dexon (70% WP)	p-dimethyl- amino- benzenediazo sodium sulfonate	5 tsp./5 gal. water	Apply to 20 sq. ft. of area. Follow with additional water to allow penetration to 3 to 5 inches. Repeat every 10-14 days. See Control Series 90.
Camellia	<u>Sclerotinia</u> flower blight	Terraclor (75% WP)	PCNB	1 cup in enough water to give thorough coverage of 100 sq. ft.	Drench soil surface in late December or early January. See Control Series 99.
	Leaf and bud gall (See Azalea <u>Exo-</u> <u>basidium</u> leaf and flower gall.				
	<u>Phytophthora</u> root and crown rot (See under Azalea)				

PLANT	DISEASE	FUNGICIDE AND FORMULATION	ACTIVE INGREDIENT	RATE	REMARKS
Carnation	<u>Alternaria</u> blight	Manzate 200 (80% WP)	Zinc ion and maneb	1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water)	Spray at 7-day intervals. Add spreader.
		Dithane Z-78 (75% WP)	Zineb	1-1/2 lb./100 gal. water (1 tbs./gal. water)	
		Fore (80% WP)	Zinc ion and maneb	1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water)	
Chrysanthemum	Powdery mildew	Actidione PM (0.027%)	Cycloheximide	6-1/4 lb./100 gal. water (5 tbs./gal. water)	Spray at 7-day intervals during growing season.
	Leaf rust	Fore (80% WP)	Zinc ion and maneb	1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water)	Spray as soon as first rust pustles appear. Repeat at 10-day intervals.
	<u>Mycosphaerella</u> ray blight	Dithane Z-78 (75% WP)	Zineb	1 lb./100 gal. water (2/3 tbs./gal. water)	Apply first spray just before flower color shows and at 7-day intervals.
		Daconil 2787 (75% WP)	Tetrachloroisophthalonitrile	1-1/2 lbs./100 gal. water (1-1/2 tbs./gal. water)	
	<u>Septoria</u> leaf spot	Dithane Z-78 (75% WP)	Zineb	1-1/2 lbs./100 gal. water (1 tbs./gal. water)	Apply at weekly intervals when new shoot growth begins. Cover lower leaf surface completely. See Control Series 49.
<u>Pythium</u> root rot	Dexon (70% WP)	p-dimethyl amino benzenediazo sodium sulfonate	5 tsp./5 gal. water	Drench at 10 to 14-day intervals.	

PLANT	DISEASE	FUNGICIDE AND FORMULATION	ACTIVE INGREDIENT	RATE	REMARKS
Cotoneaster	Fire blight	Agrimycin 17	Streptomycin sulfate	100 ppm	Spray when first blossoms open and again 10 days later. See Control Series 88.
		or Agri-Strep	Streptomycin sulfate	1/2 lb./100 gal. water (100 ppm)	
Crab apple	Fire blight	Agrimycin 17	Streptomycin sulfate	100 ppm	Start spraying when 20% of the blossoms are open and repeat in 5 days. See Control Series 88.
		or Agri-Strep	Streptomycin sulfate	1/2 lb./100 gal. water (100 ppm)	
	Scab	Cyprex (65% WP) or Orthocide 50W (50% WP) or Captan 50W (50% WP)	Dodine Captan Captan	1/2 lb./100 gal. water (1 tsp./gal. water) 2 lb./100 gal. water (1-1/2 tbs./gal. water)	Spray weekly from bud break until 2 weeks after petal fall. See Control Series 89.
Cedar-apple rust		Dithane Z-78 (75% WP)	Zineb	1 lb./100 gal. water (2/3 tbs./gal. water)	Start as flower buds open and spray 3 times at 10-day intervals. See Control Series 128.
		or Manzate 200 (80% WP)	Zinc ion and maneb	1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water)	
		or Fore (80% WP)	Zinc ion and maneb	1-1/2 lb./gal. water (1-1/2 tbs./gal. water)	
Crape Myrtle	Powdery mildew	Actidione PM (0.027% WP)	Cycloheximide	6-1/4 lb./100 gal. water (5 tbs./gal. water)	Spray as flower buds break and repeat at 7-day intervals during growing season.
		Benlate (50% WP)	Benomyl	1 lb./100 gal. water (1 tbs./gal. water)	Spray as flower buds break and repeat at 14-day intervals during growing season.
Dogwood	Anthracnose leaf and flower blight	Phaltan (75% WP) or Fore (80% WP)	Folpet Zinc ion and maneb	1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water) 1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water)	Make 4 applications: "cup" stage, petal fall, 4 weeks later and in late summer after flower buds are formed. See Control Series 109.

PLANT	DISEASE	FUNGICIDE AND FORMULATION	ACTIVE INGREDIENT	RATE	REMARKS
Dogwood (Cont'd)	<u>Septoria</u> leaf spot	Fore (80% WP) or Phaltan (75% WP)	Zinc ion and maneb Folpet	1-1/2 lbs./100 gal. water (1-1/2 tbs./gal. water) 1-1/2 lbs./100 gal. water (1-1/2 tbs./gal. water)	See above under Anthracnose leaf and flower blight. See Control Series 107.
Euonymus	Powdery mildew	Actidione PM (0.027% WP)	Cycloheximide	6-1/4 lb./100 gal. water (5 tbs./gal. water)	Spray at 7-day intervals during the growing season.
Gladiolus	<u>Botrytis</u> leaf blight	Dithane Z-78 (75% WP) or Benlate (50% WP) or Orthocide 50 (50% WP)	Zineb Benomyl Captan	1-1/2 lb./100 gal. water (1 tbs./gal. water) 1/2 lb./100 gal. water (2 tsp./gal. water) 2 lbs./100 gal. water (2 tbs./gal. water)	Spray every 7 to 10 days during normal weather, every 2 to 3 days during wet periods.
	Penicillium and Fusarium corm rots (pre-planting)	Mertect 160	2-(4-thiazoly1) benzimidazole	1.5 lbs./100 gal. water	Submerge clean bulbs for 10-15 minutes. Stir solution constantly to be sure chemical remains in suspension. See Control Series 87.
Hawthorne	Cedar-apple rust	Fermate (76% WP)	Ferbam	2 lb./100 gal. water (2-3/4 tbs./gal. water)	Start spraying at petal fall and continue at 10- to 12-day intervals until mid-June. See Control Series 128.
	Fire blight	Agrimycin 17 or Agri-Strep	Streptomycin sulfate Streptomycin sulfate	100 ppm 1/2 lb./100 gal. water (100 ppm)	Spray when blossoms are 1/4 open and again in 5 days. See Control Series 88.
Hemlock	Twig rust	Fermate (76% WP)	Ferbam	4 lb./100 gal. water (4 tbs./gal. water)	Start when buds break in the spring and continue at weekly intervals until new shoot growth is complete. See Con. Ser. 91.

PLANT	DISEASE	FUNGICIDE AND FORMULATION	ACTIVE INGREDIENT	RATE	REMARKS
Holly	Anthracnose	Dithane Z-78 (75% WP) or Manzate 200 (80% WP) or Fore (80% WP)	Zineb Zinc ion and maneb Zinc ion and maneb	2 lb./100 gal. water (1-1/3 tbs./gal. water) 1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water) 1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water)	Start spraying in late spring and continue at 14-day intervals.
Hollyhock	Rust	Fore (80% WP) or Fermate (76% WP)	Zinc ion and maneb Ferbam	1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water) 1-1/2 lb./100 gal. water (2 tbs./gal. water)	Start spraying in late May and continue at 10-day intervals thru early July. See Control Series 111.
Honeysuckle	<u>Herpobasidium</u> leaf blight	Fore (80% WP)	Zinc ion and maneb	1-1/2 lbs./100 gal. water (1-1/2 tbs./gal. water)	Spray at 7- to 10-day intervals from when buds swell to just before bloom.
Iris	<u>Heterosporium</u> leaf spot	Dithane Z-78 (75% WP) or Manzate 200 (80% WP) or Fore (80% WP) or Daconil 2787 (75% WP)	Zineb Zinc ion and maneb Zinc ion and maneb Tetrachloro- isophthalonitrile	1-1/2 lbs./100 gal. water (1 tbs./gal. water) 1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water) 1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water) 1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water)	Make 5 applications at 7- to 10-day intervals starting when leaves are 4" to 6" high.
Ivy	Leaf spot	Manzate 200 (80% WP) or Fore (80% WP)	Zinc ion and m maneb Zinc ion and maneb	1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water) 1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water)	Spray at 7-day intervals starting when new growth of leaf begins.

PLANT	DISEASE	FUNGICIDE AND FORMULATION	ACTIVE INGREDIENT	RATE	REMARKS
Laurel, Mountain	Leaf spot	Dithane Z-78 (75% WP)	Zineb	1-1/2 lb./100 gal. water (1 tbs./gal. water)	Spray when buds break in the spring and twice more at 2-week intervals.
Lilac	Powdery mildew	Bonsul Sulphur, or Corosul S, or Magnetic "95"	Sulphur	2 lbs./100 gal. water (1 tbs./gal. water)	Spray at 10- to 14-day intervals after leaves are 3/4 grown.
Narcissus (Dafodils)	Basal rot (pre-planting)	Mertect 160	2-(4-thiazolyl) benzimidazole	1-1/2 lb./100 gal. water	Submerge clean bulbs for 10-15 minutes. Stir solution constantly to be sure chemical remains in suspension.
Oxalis	Leaf rust	Fore (80% WP) or Dithane Z-78 (75% WP) or Manzate 200 (80% WP)	Zinc ion and maneb Zineb Zinc ion and maneb	1-1/2 lbs./100 gal. water (1-1/2 tbs./gal. water) See Iris leaf spot 1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water)	Spray as soon as first rust pustules appear.
Pachysandra	<u>Volutella</u> Leaf and stem blight	Ferbam (76% WP) or Fore (80% WP)	Ferbam Zinc ion and maneb	2 lb./100 gal. water (2 tbs./gal. water) 1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water)	Apply first spray in the spring. Make 5 applications at 10- to 14-day intervals.
Peony	<u>Botrytis</u> blight	Dithane Z-78 (75% WP) or Benlate (50% WP) or Orthocide 50 (50% WP)	Zineb Benomyl Captan	2 lb./100 gal. water (1-1/3 tbs./gal. water) 1/2 lb./100 gal. water (2 tsp./gal. water) 2 lb./100 gal. water (2 tbs./gal. water)	Spray when shoots are 3" to 6" high and again when they are 10" to 18" high. See Control Series 120.

PLANT	DISEASE	FUNGICIDE AND FORMULATION	ACTIVE INGREDIENT	RATE	REMARKS
Periwinkle (<i>Vinca minor</i>)	Stem canker and leaf spot (<i>Rhizoctonia</i> , <i>Phomopsis</i>)	Benlate (50% WP)	Benomyl	1 lb./100 gal. water (1 tbs./gal. water)	Thoroughly soak stems and soil before disease appears (April in Tidewater area), and make a second application 4 weeks later.
Photinia (<i>Photinia serrulata</i>)	Powdery mildew	Benlate (50% WP)	Benomyl	1 lb./100 gal. water (1 tbs./gal. water)	Spray at 14-day intervals starting when new leaf growth starts.
Pyracantha (firethorn)	Scab	Captan 50 W (50% WP)	Captan	2 lb./100 gal. water (1-1/2 tbs./gal. water)	Apply the spray at bud-break, 7 to 10 days later, and at petal fall. See Control Series 89.
	Fire blight	Streptomycin ag. compound or Agri-Strep	Streptomycin sulfate Streptomycin sulfate	100 ppm 1/2 lb./100 gal. water (100 ppm)	Spray when 20% of the blossoms are open and repeat every 5 to 7 days during bloom period. See Control Series 88.
Rhododendron (See Azalea)					
Rose	Black spot	Phaltan (75% WP) or Daconil 2787 (75% WP) or Benlate (50% WP)	Folpet Tetrachloroisophthalonitrile Benomyl	1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water) 1 lb./100 gal. water (7 tsp./gal. water) 1 lb./100 gal. water (1 tbs./gal. water)	Start applications in the spring as leaves expand. During dry weather treat at 7-10 day intervals for Daconil or Phaltan. Use a 10 to 14-day interval with Benlate. Shorten intervals with all materials during rainy or humid weather. See Control Series 85.

PLANT	DISEASE	FUNGICIDE AND FORMULATION	ACTIVE INGREDIENT	RATE	REMARKS
Rose (Cont'd)	Powdery mildew	Actidione PM (0.027 % WP)	Cycloheximide	3-1/8 lb./100 gal. water (2 tbs./gal. water)	Start applications in the spring as leaves expand. Spray at 7-day intervals with Actidione PM and at 14-day intervals with Benlate. See Control Series 86.
		or Benlate 50%	Benomyl	1 lb./100 gal. water (1 tbs./gal. water)	
Snapdragon	Rust	Dithane Z-78 (75% WP)	Zineb	1-1/2 lb./100 gal. water (1 tbs./gal. water)	Spray as soon as rust pustules appear. Repeat at 10-day intervals.
	<u>Cercospora</u> leaf spot	Same as rust above			Apply spray at 10 to 14-day intervals.
Tulip	<u>Botrytis</u> blight	Fore (80% WP)	Zinc ion and maneb	1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water)	Apply the spray at 7- to 10-day intervals beginning when the plants are 4" high. At least 4 applications should be made. See Control Series 100.
		Captan 50W (50% WP)	Captan	2 lbs./100 gal. water (1-1/2 tbs./gal. water)	
		Orthocide 50 (50% WP)	Captan		
Yew	<u>Phytophthora</u> root and crown rot (See under Azalea)				
Zinnia	<u>Alternaria</u> blight	Fore (80% WP)	Zinc ion and maneb	1-1/2 lb./100 gal. water (1-1/2 tbs./gal. water)	Make 4 applications at 10 to 14-day intervals starting when plants are 10" to 12" high.
	Powdery mildew	Actidione PM (0.027% WP)	Cycloheximide	6-1/4 lb./100 gal. water (5 tbs./gal. water)	Spray during growing season at 7-day intervals.

Trade and brand names are used only for the purpose of information and the Virginia Cooperative Extension Service does not guarantee nor warrant the standard of the product, nor does it imply approval of the product to the exclusion of others which may also be suitable.

KEYS TO PROPER USE OF PESTICIDES

1. Read the label on each pesticide container before each use. Follow instructions to the letter; heed all cautions and warnings, and note precautions about residues.
2. Keep pesticides in the containers in which you bought them. Put them where children or animals cannot get to them, preferably under lock and away from food, feed, seed, or other material that may become harmful if contaminated.
3. Dispose of empty containers in the manner specified on the label. If disposal instructions are not printed on the label, burn the containers where smoke will not be a hazard, or bury them at least 18" deep in a place where water supplies will not be contaminated.

SEE YOUR DOCTOR IF SYMPTOMS OF ILLNESS OCCUR DURING OR AFTER USE OF PESTICIDES