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Chemical Disease Controls for the Greenhouse Industry Michigan State University Michigan State University Extension Mary K. Hausbeck and Bryan J. Webster, Department of Plant Pathology Issued May 2006 2 pages

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Chemical Disease Controls for the Greenhouse Industry



Note: An X in the table below indicates which pathogens are listed on product labels by the company selling the product. It does not guarantee that the pesticide products will provide adequate control of the pathogens listed on the label. For more information on how well pesticide products worked in research trials and for the correct rates for specific crops, contact a greenhouse extension agent in your area.



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Alvan.	Car	\ c _{\text{\tin}\text{\text{\text{\text{\text{\text{\text{\text{\text{\ti}\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\ti}\text{\texient{\texi}\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\ti}}\tint{\text{\text{\text{\ti}\tint{\text{\text{\texi}\text{\text{\texi}\text{\text{\texi}\tint{\text{\texicl}\tint{\texitile}\tint{\ticrimt{\text{\texi{\text{\text{\texi}\tint{\text{\texit{\texi}\ti}	16gg		PHI	al Pythi	cylind	adily Filsal	Ahizol Parizol	Scien	Thie	A Public	V Grand	ats, Bold	Ponde		
26 GT 	iprodione thiophanate-methyl	Bayer Cleary		12			X	X	X	X	X	X	X X	X	X	X	Do not use 26GT fungicide as a soil drench on impatiens or pothos. Do not use 26GT fungicide on spathiphyllum. Cleary's 3336G, GC are not labeled for leaf/flower spots or blights. Use of a wetting agent is recommended. Not
4 Flowable Mancozeb	mancozeb	Lesco		24	Х		X	Х	X				X	X		X	recommended for use on Swedish ivy, Boston fern or Easter cactus. The use of a spray adjuvant will improve performance. Do not use treated plants/fruits for food or feed purposes.
Agri-Fos	mono- and di-potassium salts	AgBio	0	4	Х	X											Also labeled for the control of bacterial blight and fire blight.
Aliette WDG	aluminum tris	Bayer		12	Х	Х											Also labeled for the control of downey mildew and fire blight. Can be applied as a foliar spray, drench application, or soil incorporation.
Allban 50WSB, Flo	thiophanate-methyl phosphorous acid	Scotts Cleary		12 4	Х	Х	Х	Х	Х	Х	Х	Х	X	Х	Х	Х	Addition of surfactant improves distribution of product on hard-to-wet plants such as roses. Also labeled for bacterial blights and downy mildew. Do not apply to plants that are heat or moisture stressed.
Banol	propamocarb hydrochloride	Bayer		24	Х	Х											For use at all stages of ornamental propagation.
Banrot 8G, 40WP	etridiazole + thiophanate-methyl	Scotts		12	Х	Х		Х	X		Х						
Botran 75-W Camelot	dicloran copper salts	Gowan Whitmire Micro-Gen	0	12 12	Х							X	X	X	X		Camelot is also labeled for control of bacterial diseases caused by <i>Erwinia, Psuedomonas,</i> and <i>Xanthomonas</i> spp. Labeled for control of downy mildew on various ornamental species. Do not apply to Easter lily when in
Captan 4L	captan	Drexel		4 days								Х	Х	X		Х	bloom. Controls damping-off of cuttings. Do not spray the crops listed on the label beyond the point of drip from the
Captan 50WP	captan	Micro-Flo		4 days								Х	X	X		Х	leaf surface. Also controls damping-off of cuttings (see label for specific crops). Do not spray the crops listed on the label beyond the point of drip from the leaf surface.
Captan Pro 80 WDG	captan	Arysta LifeScience		4 days								Х	Х	X	Х	Х	Also controls damping-off of cuttings (see label for specific crops). Do not spray the crops listed on the label beyond the point of drip from the leaf surface.
Captec 4L	captan	Micro-Flo		4 days								Х	X	Х		Х	Also controls damping-off of cuttings (see label for specific crops). Do not spray the crops listed on the label beyond the point of drip from the leaf surface. Open greenhouse vents during application and for at least one hour following.
Champ DP, Formula 2F	copper hydroxide	Agtrol	0	24	Х								Х	X	Х		Also labeled for bacterial diseases on certain crops (see label). Dry prill is a formulation resulting in virtually no dust. Do not tank mix with Aliette.
Champion WP	copper hydroxide	Agtrol	0	24	Х								Х	Х	Х		Also controls bacterial leaf spot on certain crops (see label) and downy mildew on pansy and snapdragon. Do not apply to hibiscus in flower. To avoid residues on commercial plants, do not spray just before selling. Do not tank mix with Aliette.
Chipco 26019, Flo	iprodione	Bayer		12			X	Х	X			Х	Х	X			May be applied as a foliar application, soil drench, or dip. Do not use as a soil drench on impatiens or pothos. Do not use product on spathiphyllum.
Chlorostar VI	chlorothalonil	Regal		48	Х		X	Х	X	Х			X	Х		Х	Avoid applications during bloom period on plants where flower injury is unacceptable. Discontinue applications to poinsettia prior to bract formation.
Companion Compass	Bacillus subtilis GB03 trifloxystrobin	Growth Products OHP		4 12	X	X		X	X				Х	X	Х	Х	Most effective when applied as a preventative treatment. Only registered for use in protected glass- or greenhouses. Also controls downy mildew. Applications to poinsettia after bract formation may cause injury. May cause
ConSyst WDG	chlorothalonil + thiophanate	Regal		48									Х	X	Х	Х	injury to petunia, violet and New Guinea impatiens. Do not use on ferns. Do not use as a drench on pansy. Labeled as fungistatic to <i>Pythium</i> diseases when used in a regular program. Also labeled for downy mildew.
Contrast 70WSP	flutolanil	Scotts		12					X			Х				Х	Use with a surfactant may improve coverage. Make no more than four applications of Contrast 70WSP per year to ornamental plantings.
Cygnus Daconil Ultrex,	kresoxim-methyl chlorothalonil	BASF Syngenta		12 12	Х		X	Х	X	Х			X	X	X	X	Also labeled for downy mildew on rose and snapdragon. Do not apply to either green or variegated pittosporum or schefflera.
Weather Stik, Zn Decree 50WDG	fenhexamid	SePRO		12										X			This product should be used in a program with other fungicides to provide season-long protection. Avoid making
 Dithane DF, 75DF	mancozeb	Dow Agro		24	Х		X	Х	X				X	X		X	more than two consecutive applications of this product. After the second application, use an alternative botryticide for two consecutive sprays before reapplying this product. Use with a surfactant will improve performance. Do not apply on French dwarf double or signet-type marigold
Eagle 20EW, 40WP	myclobutanil	Dow Agro		24									Х		Х	Х	seedlings. Do not use for food or feed purposes. Apply twice weekly to chrysanthemums during bloom period. Do not use treated plant materials for food or feed purposes. See label for specific use instructions for chrysanthemum.
Echo 720, Ultimate, Zn	chlorothalonil	Sipcam		12	Х		Х	Х	Х				Х	Х	Х	Х	Avoid applications during bloom period on plants where flower injury is unacceptable. Discontinue applications to poinsettia prior to bract formation.
Fenox ME Fore 80WP	mefenoxam mancozeb	Regal Dow Agro		24	X	X	X	Х	X				Х	X		Х	Check label for precautions concerning specific crops. The addition of a spreader-sticker will improve fungicide performance. Do not apply on French dwarf double or signet-type marigold seedlings. Do not use treated plants for food or feed purposes.
	azoxystrobin	Syngenta		4	Х			Х	X				X	X	Х	Х	The addition of a non-silicone based wetter-sticker is recommended to enhance coverage. Also controls downy mildew on rose. To reduce possible resistance, do not make more than three consecutive applications before
Iprodione Pro 2SE	iprodione	Micro-Flo		12			X	X	X			Х	Х	X			alternating with a fungicide with a different mode of action. Do not use this product as a soil drench on impatiens and pothos. Do not use Iprodione Pro2SE on spathiphyllum.
Junction	mancozeb + copper hydroxide	SePR0		24	Х								X	X	X	X	Do not apply in a spray solution of pH less than 6.0. Also controls certain bacterial diseases (see label). Avoid spraying azaleas, carnations, chrysanthemums and roses just prior to selling season due to possible foliar and/or bloom discoloration. Not recommended for use on French marigold. Do not use treated plants for food or
Kocide 2000	copper hydroxide	SePRO		24	Х								X	X	Х		feed purposes Kocide 2000 T/N/O is not labeled for use on vegetables. Also controls bacterial leaf spot on certain crops (see label)
KOP-Hydroxide 50	copper hydroxide	Drexel	0	24								Х	Х	X	Х		and downy mildew on pansy. Discoloration of foliage and/or blooms of some crops has been noted. Do not use in a spray solution of pH less than 6.5 or greater than 9.0. Also controls bacterial leaf spot on certain cultivars. Discoloration of azalea, carnation, chrysanthemum, ivy and rose foliage and/or blooms have been noted
Mancozeb DG,	mancozeb	Lesco		24	Х		Х	X	Х				X	X		X	in some varieties. To prevent residues on commercial plants, do not spray just before selling season. The use of a spray adjuvant will improve performance. Do not use treated plants for food or feed purposes.
4 Flowable Manhandle	mancozeb	Lesco		24	Х		X	Х					Х	X	X	X	Do not use on French dwarf double or signet-type marigold seedlings. Do not apply through irrigation.
Manicure 6 Flowable, Ultra Medallion	chlorothalonil fludioxonil	Lesco Syngenta		12	X		X	X	X	X	Y		X 	X	X	X	Do not use on green or variegated pittosporum or schefflera due to possible phytotoxicity. Discontinue use prior to poinsettia bract formation due to possible phytotoxicity. Drench applications at seedling stage to impatiens or New Guinea impatiens may cause stunting and/or chlorosis.
Micro Sulf	sulfur	Agtrol	0	24			, A	, A	, A				X	^	Х	Х	Greenhouse-grown crops may be much more sensitive to sulfur injury, so the lowest rate should be tried initially. Also controls two-spotted mite, rust on selected ornamentals (see label), and botrytis blight on hydrangea.
MilStop	potassium bicarbonate	Bioworks, Inc.	0	1				Х					Х	Х	Х	Х	Do not apply this product with any other fertilizer or pesticide. MilStop is not to be applied through any irrigation system.
Mycostop	Streptomyces griseoviridis	AgBio	0	4	X	Х		X	X				V	X	v		Also can be used as a seed treatment.
Nordox 75WG OHP 6672 50W, 4.5L	cuprous oxide thiophanate-methyl	Monterey OHP	U	24 12	X		X	Х	X	X	Х	Х	Х	X	X		Do not tank mix with Aliette fungicide. Labeled for control of many bacterial diseases. Use of a wetting agent is recommended for plants that have hydrophobic leaves. May be applied as a foliar application, soil drench, or dip.
Pentathlon DF, LF Physan 20	maneb quaternary	SePRO Maril		24	X	X	X	X	X			X	X	X	Y	X	Do not use on French dwarf double or signet-type marigold seedlings. Also controls <i>Cylindrocladium</i> on azalea. Also labeled for downy mildew and certain bacterial diseases (see label). Also labeled for use as a disinfectant on
	ammonium chlorides							, A	, A					^		*	greenhouse work areas and equipment to prevent cross-contamination of fungal and bacterial pathogens, algae, mildews and TMV.
Phyton 27, New Dimension Pipron 84.4LC	copper complex piperalin	Source Technology SePRO		12	X		X		X				X	X	X	X	Also controls <i>Erwinia</i> on a variety of ornamental plants (see label), <i>Pseudomonas</i> on geranium and impatiens, <i>Xanthomonas</i> on begonia and geranium, and downy mildew on snapdragon. Use caution when applying to poinsettia bracts and begonias. Do not treat hydrangea after flower buds are visible.
PlantShield HC	Trichoderma harzianum	Bioworks, Inc.	0	0		X	X	X	X	X	X	X		X	X		Use with a non-ionic spreader-sticker is recommended when applying to foliage or stem. Can be applied in hydro-
Plantvax 75W	oxycarboxin	Chemtura		12												V	ponic systems and subirrigation. Also labeled for <i>Myrothecium</i> and downy mildew. <i>Trichoderma harzianum</i> strain T-22 will colonize roots in all types of growing media, at pH 5 to 8, and at temperatures ranging from 50 to 94°F. Do not mix with insecticides and acaricides, as plant injury may occur.
Propiconazole Pro	propiconazole	Micro-Flo		24	V		V	V	V				X	V	X	X	Do not apply to African violets, begonias, Boston fern, or geraniums.
Protect DF, T/O Revere 10G	mancozeb pentachloronitro- benzene	Cleary Lesco		12	X		X	X	X	X		Х	Х	X		X	The addition of a spreader-sticker will improve fungicide performance. Also labeled for downy mildew.
Rhapsody AS	Bacillus subtilis QST 713	Bioworks, Inc.		4	Х	Х		Х	Х				Х	X	Х	Х	Rhapsody AS is registered for soil applications ONLY in protected growing environments such as glass- or greenhouses.
RootShield	Trichoderma harzianum	Bioworks, Inc.	0	0		X	Х	Х	Х		Х	Х					Also labeled for <i>Myrothecium</i> . Granules become active above 50°F and are not effective when temperature remains cold. <i>Trichoderma harzianum</i> strain T-22 will colonize roots in all types of growing media, at pH 5 to 8, and at temperatures ranging from 50 to 94°F.
Rubigan EC	fenarimol	SePRO OHP		12			V	v	V			V	v	V	Х		Do not apply this product through irrigation.
Sextant Spectro 90WDG	iprodione chlorothalonil	Cleary		12			X	X	X	X		^	X	X	X	X	Do not use Sextant as a soil drench on impatiens or pothos. Do not use on spathiphyllum. May be used as a soil drench or root dip on various plant species (see label). Do not use on green or variegated pittosporum or schefflera more than one time. Not recommended for Swedish ivy,
Stature DM	dimethomorph	SePRO		12	Х												Boston fern, or Easter cactus. Also labeled for control of downy mildew on certain plant species.
Strike 50WDG Subdue GR, MAXX	triadimefon mefenoxam	OHP Syngenta		12 0	Х	Х				X			Х		Х	X	Check label for precautions concerning specific crops.
SysStar WDG	thiophanate-methyl + flutolanil	Regal		12					Х	X			X	X	X		Make no more than four applications of SysStar per year to ornamental plantings. Do not use any treated plants for food or feed purposes.
SysTec 1998, 1998 WDG Systhane WSP	thiophanate-methyl myclobutanil	Regal Dow Agro		12 24			X	X		X	X	X	X	X	X	X	May be applied as a foliar application, soil drench, or dip. The use of a spray adjuvant will improve performance.
T-Storm F, 50WSB Terraclor 400, 75WP	thiophanate-methyl PCNB	Lesco Chemtura	0	12 12			Х	Х	X	X	Х	X	X	X	Х		This product is not recommended for the following plants: Swedish ivy, Boston fern, and Easter cactus. Labeled for botrytis rot only, not botrytis blight. Do not apply to <i>Magnolia fuscata</i> as injury may result.
Terraguard 50W Terrazole 35WP	triflumizole etridiazole	Chemtura Chemtura		12 12	Х	Х	Х	Х	Х		Х		Х	X	X	X	Do not use on impatiens plugs. Do not exceed 2 oz/100 gal on impatiens transplants.
Triact 70	neem oil	ОНР		4									Х	Х	Х	Х	Also labeled for downy mildew and insects, including whiteflies, aphids, mites, and scales. Do not use on sensitive species, such as impatiens, fuchsia, hibiscus,
																	sensitive species, such as impatiens, fuchsia, hibiscus, some rose flowers or some carnation varieties, without prior testing.
Truban 25EC, 30WP Turfcide 10G	etridiazole PCNB	Scotts Chemtura	0	12 12	Х	X			X	X		Х					Mix Turficide 10G into soil medium for best results.
ZeroTol	hydrogen dioxide	BioSafe Systems		0	Х	Х		X	Х		Х	Х	Х	Х	Х	Х	Also controls downy mildew and <i>Pseudomonas</i> and <i>Xanthomonas</i> . Also labeled for use on greenhouse work areas and equipment.
Zyban WSB	thiophanate-methyl + mancozeb	Scotts		24				Х	X	Х			Х	Х	Х	X	Also controls downy mildew. Do not use on French marigold or gloxinia.
X = Pathogens are I	isted on label																

Revised by Carolyn J. Randall, Pesticide Education Program, Michigan State University Extension

6:30 a.m. – 4:30 p.m. Pacific Time Zone 1-800-858-7378 FAX: 1-541-737-0761	uoi	isnətzi VisrəvinU ətat2 nagidoil	M ,msrgon Program, M	ƙevised by Carolyn J. Randall, <i>Pe</i>					
toxicology, general pesticide information and emergency response assistance. Funded by EPA, based at Oregon State University 7 days a week; excluding holidays	sls *1-800-405-0101 Michigan Department of Agriculture Spill Response		Telephone Number Operated 24 Hours						
and managing pesticide poisoning,	*1-800-292-4706	,	www.aspca.org						
Provides advice on recognizing	System (PEAS):	9099-9EE (LIS)*	116*	41-888-476-443 2					
Information Center	Emergency Alerting	Michigan State Police:		fee per case)					
Mational Pesticide	MDEQ Pollution	Operations Division,		Animal Poison Control Center (\$50 consultation					
	pue	pue	pue	10					
(211) 541-0536	Phone No.	Phone No.	Phone No.	Phone Mo.					
.m.q ∂–.m.8 8 :viday- Friday:	(MDEQ) Office Phone No.								
Stewardship Division.	Environmental Quality								
Department of Agriculture Environmental	Department of	sheriff's department:							
Michigan Clean Sweep, Michigan	District Michigan	Local police department or	Local fire department:	Your veterinarian:					
noitemyoful	Pollution	Accident	Fire	Poisoning Policy					
Pesticide Disposal	E nvironmental	Traffic	Pesticide	IsminA					

Special Pesticide Emergencies

1-800-222-1222

From anywhere in the United States, call Polson Control

Human Pesticide Poisoning

Current as of June 2005 For any type of an emergency involving a pesticide, immediately contact the following emergency information centers for assistance. PESTICIDE EMERGENCY INFORMATION



Web: npic.orst.edu

Michigan State University

Major Revision (destroy old) 5:06-1M-KMF/GP, \$4, for sale only.

transplanted as food crops later.

condemnation of the crop.

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manufacturer or distributor after publication of this bulletin. If you often. Some chemicals listed in this bulletin may be dropped by the Always check the label for updated information. Labels change

Vegetables include any plants being used as food or that will be

Any use inconsistent with the label can lead to injury of crops,

label other than the "Agricultural Use Requirements" box.

cals used in the greenhouse must have Worker Protection

humans, animals and the environment and can lead to fines and/or

Standards and list "greenhouse" or "glasshouse" in a location on the

The Michigan Department of Agriculture (MDA) requires that chemi-

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Chemical Disease Controls for the Greenhouse Industry



when applied by themselves may cause damage when mixed the whole crop. Chemicals that may not cause phytotoxicity cals) and check them for damage 7 days later — before treating of each variety with any new chemical (or combination of chemi-

possibility of phytotoxicity. Always treat a small portion of plants high temperatures or high humidity) because this increases the Do not apply chemicals to plants that are stressed (by water,

or manufacturer. pesticides, contact your county Extension office, pesticide dealer have questions about the legality and/or the registration status of

Department of Plant Pathology By Mary K. Hausbeck and Bryan J. Webster