

Efficacy of Management Tools for Foliar *Phytophthora* Species. **DRAFT 5**

Ornamental Protocol Number: 09-003

Objective: Determine efficacy of new active ingredient formulations and new biopesticides for managing foliar diseases of ornamental plants caused by *Phytophthora* species.

Experimental Design:

Plot Size: Must be adequate to reflect actual use conditions.

Replicates: Minimum of 4 replications

Application Instructions: Apply each treatment according to directions below. For contact products, the recommendation is every 7 days; for systemic products the recommendation is every 14 to 28 days depending upon label directions. Applications should be made using application equipment consistent with conventional commercial equipment.

Target Species: *Phytophthora ramorum*. Contact your regional coordinator if other target species are of interest. *P. drechsleri* may be added if trials are not completed in the 2007 research program.

Plant Hosts: Use a plant host suitable for target species, recording species and variety used.

Use Site: May be greenhouse, field container or field in-ground.

Evaluations:

For *P. ramorum*: After application of fungicide treatment, hold plant for 7 days for systemic products or 2-3 days for contact materials before inoculation ensuring that neither rain nor irrigation water wash off treatments. Inoculate detached leaves 7 DAT for systemic products or 2-3 DAT for contact materials. Wound-inoculate 3 leaves per replication and treatment using sporangia or zoospores as inoculum. Inoculation control consist of same treatment using plain water (instead of sporangia/zoospores). Record phytotoxicity 0, 7, 14, and 28 days after fungicide/biopesticide application on a scale of 0 to 10 (0 = no phytotoxicity; 10 = complete kill). If phytotoxicity is observed in treated plants, take pictures comparing treated and untreated plant material. Disease severity will be assessed 7-10 days after inoculation on detached leaves as lesion area and percentage of leaf that shows lesions.

For Other *Phytophthora* species: Record disease severity and incidence 0, 7, 14, and 28 days after application for herbaceous plant material. For woody plant material, record disease severity and incidence 0, 14, 28, 42 and 56 days after initial application. Record plant height & width at initial and final evaluations only. Record phytotoxicity at each rating date on a scale of 0 to 10 (0 = no phytotoxicity; 10 = complete kill). If phytotoxicity is observed in treated plants, take pictures comparing treated and untreated plant material.

If different application methods or evaluations are made, please clearly specify differences in final report and explain how they enhanced results.

Recordkeeping: Keep detailed records of weather conditions including temperature and precipitation, soil-type or soil-less media, application equipment, application volume per area, irrigation, pot/liner size, plant height & width, and plant growth stage at application and data collection dates.

Treatments:

See tables on the following pages. Standards and A priority treatments are in the first table. B and C priority treatments are in the second table.

Reports:

Reports submitted on the standard IR-4 Ornamental Horticulture Research Report Form are preferred. However, reports in the F&N Tests format are acceptable as long as those reports are amended with detailed experimental design and materials and methods, along with raw data, recordkeeping information, and any pictures.

A report submitted electronically is preferred but not required. If the report is provided electronically, the basic report can be sent in MS Word or WordPerfect, the recordkeeping information as pdf or other electronic documents, and the raw data in MS Excel or other suitable program such as ARM.

Please direct questions to: Cristi Palmer, IR-4 HQ, Rutgers University, 500 College Road East, Suite 201W, Princeton, NJ 08540, Phone 732-932-9575 x4629, palmer@aesop.rutgers.edu OR Ely Vea, 308 Aston Forest Lane, Crownsville, MD 21032, Phone & FAX#: 410-923-4880, E-mail: evvea@comcast.net.

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Revised By: CLP

Priority A and Standard Treatments List with rates, special application instructions, and contact information to obtain product and any suitable adjuvant needed.

Priority	#	Product	Rates	Reapplication Interval	Special Application Instructions (Soil Drench)	Contact Information to obtain materials and any needed adjuvants
A	1	Adorn 4SC (fluopicolide) aka V-10161	1 fl oz/100gal	28 day	Soil Drench: 1 pint solution per sq ft. Increase volume to 2 pints solution per sq ft if soil media depth is greater than 4 inches.	Valent, Joe Chamberlin, 770-985-0303, jcham@valent.com
	2	Adorn 4SC (fluopicolide) aka V-10161	2 fl oz/100 gal	28 day		
	3	BAS 651F	22.5 fl oz	7 day	Make foliar application as spray to run-off	BASF, Kathie Kalmowitz, 919-270-4592, kathie.kalmowitz@basf.com
	4	BAS 651F	32 fl oz	14 day		
	5	cg100	0.4%	7 day interval		Summerdale, Bob Coleman, 608-826-6667, colemab95@msu.edu
	6	cg100	0.8%			
	7	Disarm 480SC (fluoxastrobin)	4 oz/100 gal	21 d	Drench at 1 – 2 pints per sq ft	OHP, Jeff Dobbs, 770-992-0121, jdobbs@OHP.com
	8	Disarm 480SC (fluoxastrobin)	8 oz/100 gal			
	9	Regalia SC	0.5%	7 d	Foliar	Marrone Organic Innovations, Mike Martinez, 559-412-7652, mmartinez@marroneorganics.com
	10	Regalia SC	1%			
	11	NOA 446510 (mandipropamide)	4 oz/100 gal	14 day (spray)	Apply spray application 2 days prior to inoculation; <i>do not add organosilicone surfactant;</i>	Syngenta, Nancy Rechsigl, 941-708-9338, nancy.rechsigl@syngenta.com
	12	NOA 446510 (mandipropamide)	8 oz/100 gal			
Standards	7	Standard Control 1*	See below	See below	See below	See below
	8	Standard Control 2*	See below	See below	See below	See below
	9	Untreated Uninoculated	--	--	--	
	10	Untreated Inoculated	--	--	--	

* Select 2 of the four standards below

Standards	a	Aliette (fosetyl Al)	6.4 to 12.8 oz/100 gal		Apply 2 pints solution per sq ft	Bayer, Mike Gorrell, , mike.gorrell@bayercropscience.com
	b	Captan	See label for specific rate based on plant		Refer to label for directions	Arysta, Doug Houseworth, 904-321-0795, LHouse9@aol.com
	c	Subdue Maxx	See label for specific		Refer to label for directions	Syngenta, Nancy Rechsigl, 941-708-9338,

Priority	#	Product	Rates	Reapplication Interval	Special Application Instructions (Soil Drench)	Contact Information to obtain materials and any needed adjuvants
		(mefenoxam)	rate based on plant species			nancy.rechcigl@syngenta.com
	d	Terrazole (etr Diazole)	8 oz/100 gal		Refer to label for specific directions based on planting location or container size	OHP, Jeff Dobbs, 770-992-0121, jdobbs@OHP.com
	e	Stature SC (dimethomorph)	Foliar disease 12.25 fl oz	14 d intervals	Apply at 14 d intervals as foliar or as a sprinch application	BASF, Kathie Kalmowitz, 919-270-4592, kathie.kalmowitz@basf.com

Priority B & C Treatments List with rates, special application instructions, and contact information to obtain product and any suitable adjuvant needed.

Priority	Product	Rates	Reapplication Interval	Special Application Instructions	Contact Information to obtain materials and any needed adjuvants
B	Alude	14 d	Drench: Apply 1 pint per sq ft. Foliar: Tank mix with Protect 1lb/100 gal Record species	Cleary, Rick Fletcher, 732-329-8399, rick.fletcher@clearychemical.com	14 d
B	Agri-Fos	12.7fl oz/100 gal		Drench: Apply at 25 gal per 100 sq ft (1 pint per sq ft).	AgBio, Jan Meneley, 303-469-9221, agbio@agbio-inc.com
B	Fenstar (fenamidone)	14.0 oz/100 gal		Drench at 1 – 2 pints per sq ft.	Bayer, Mike Gorrell, mike.gorrell@bayercropscience.com
B	Insignia (pyraclostrobin)	8 oz/100 gal for herbaceous plants and 12 or 16 oz for applications to woody species		For foliar application apply to run-off or as a sprench	BASF, Kathie Kalmowitz, 919-270-4592, kathie.kalmowitz@basf.com
B	Magellan	Foliar applications: Herbaceous: 1.25 – 4 pints per 100 gal Woodies: 2 – 5 pints per 100 gal Drench application: 6 – 12 fl oz/100 gal	14 d for bedding plants 30 d for conifers 28 d	Apply 2 pints solution per sq ft.	Nufarm, Darin Allred, 919-655-0061, Darin.Allred@us.nufarm.com
C	Remedier (Trichoderma harzianum & viride)				
B	Segway (cyazofamid)	3.0 oz/100 gal	14 – 28 d	DO NOT add organosilicone surfactant	FMC, Bobby Walls, 919-735-3862, Bobby.Walls@fmc.com
B	Taegro (<i>Bacillus subtilis</i> var. <i>amyloliquefaciens</i>)	3.5 oz/100 gal	14 d	For <i>Phytophthora</i> foliar diseases, Taegro should be applied as alternate drench and foliar spray applications. First application should be a drench followed by foliar spray after 14 d and drench in the next 14 d	Novozymes Biologicals Sam Gnanamanickam SSGN@novozymes.com
B	SP2015 (famoxadone +cymoxanil)				SePro, Todd Bunnell, 317-216-5667, toddb@sepro.com

Priority	Product	Rates	Reapplication Interval	Special Application Instructions	Contact Information to obtain materials and any needed adjuvants
B	Vital	Herbaceous: 2 - 4 pints/100 gal Woodies: Drench application: 4 pints/100 gal per 400 sq.ft. Foliar application: 4 pints/100 gal	14 d 30 d 14 d		Luxembourg Industries, Vince Morton, 336-286-9714, mortv@aol.com