

Efficacy of Management Tools for Soil-borne *Phytophthora* Species.

Ornamental Protocol Number: 06-001

Objective: Determine efficacy of soil drenches with new active ingredient formulations and new biopesticides for managing root, crown and stem rots 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: If plants are to be transplanted, transplant at least 5 days prior to treatment applications so any wounds occurring during transplanting will heal and not serve as access points for disease infection and/or not contribute to increased phytotoxicity. Drench each treatment 2-3 days prior to inoculation with known species of *Phytophthora* except Muscodor which should be applied after inoculation. For woody plant material, reapply treatments 4 weeks later. For phosphorus acid generators, a foliar application may be substituted for the drench application. Applications should be made using application equipment consistent with conventional commercial equipment.

Target Species: *Phytophthora cinnamomi*, *P. nicotianae*, *P. citricola*, and *P. cactorum*. Contact your regional coordinator if other target species are of interest.

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. Please specify in final report.

Evaluations: 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.

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.

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

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 must include:

Results summary (no more than one page)

Summary table with appropriate statistical analyses

Experimental design and materials and methods

Appendices: raw data and recordkeeping information as listed above

If pictures were taken, please include them.

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, 681 US Hwy 1 S, North Brunswick, NJ 08902-3390, Phone 732-932-9575 x629, palmer@aesop.rutgers.edu OR Ely Vea, 308 Aston Forest Lane, Crownsville, MD 21032, Phone & FAX#: 410-923-4880, E-mail: evvea@comcast.net.

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		Special Application Instructions (Soil Drench)	Contact Information to obtain materials and any needed adjuvants
			Herbaceous Plants	Woody Plants		
A	1	Cyazofamid	3.0 oz/100 gal	3.0 oz/100 gal	Reapply at 14 – 28 d intervals. DO NOT add organosilicone surfactant	ISK, Mel Grove, 713-393-3750, grovem@iskbc.com
	2	Cyazofamid	6.0 oz/100 gal	6.0 oz/100 gal		
	3	Fenamidone	7.0 oz/100 gal	7.0 oz/100 gal	Drench at 1 – 2 pints per sq ft.	Bayer, Mike Gorrell, mike.gorrell@bayercropscience.com
	4	Fenamidone	14.0 oz/100 gal	14.0 oz/100 gal		
	5	MultiGuard (furfural)	500 ppm drench	500 ppm drench	Drench application every 7 days; MultiGuard Protect contains 8.68 lbs. furfural/gallon: to make a 1,000 PPM solution, use 0.96 ml Multiguard Protect/liter of drench solution. Drench solutions should be made immediately prior to use. For drench applications, sufficient drench solution should be applied so that water just starts running from the pots. This will ensure complete distribution of the product throughout the root zone.	Agriguard, Jerry Hensley, 731-664-9185, jhensley@agriguardcompanyllc.com
	6	MultiGuard (furfural)	1000 ppm drench	1000 ppm drench		
	7	NOA 446510 (mandipropamid)	2 oz/100 gal	2 oz/100 gal		
	8	NOA 446510 (mandipropamid)	8 oz/100 gal	8 oz/100 gal	Drench application – reapply 7 – 14 day interval.	Syngenta, Dave Ross, 336-632-6411, david.ross@syngenta.com
	9	V-10161 4FL	30 ml/100gal	30 ml/100gal		
		10	V-10161 4FL	60 ml/100 gal	60 ml/100 gal	Apply 2 pints solution per sq ft
Standards	11	Standard Control 1*	See below	See below	See below	See below
	12	Standard Control 2*	See below	See below	See below	See below
	13	Untreated Uninoculated	--	--	--	
	14	Untreated Inoculated	--	--	--	

* Select 2 of the four standards below

Standards	a	Aliette (fosetyl Al)	6.4 to 12.8 oz/100 gal	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, LJHouse9@aol.com
	c	Subdue Maxx (mefenoxam)	See label for specific rate based on plant species		Refer to label for directions	Syngenta, Dave Ross, 336-632-6411, david.ross@syngenta.com
	d	Terrazole (etridiazole)	8 oz/100 gal	8 oz/100 gal	Refer to label for specific directions based on planting location or container	Chemtura, Kevin Donovan, 203-573-2028, kevin.donovan@chemtura.com

Priority	#	Product	Rates		Special Application Instructions (Soil Drench)	Contact Information to obtain materials and any needed adjuvants
			Herbaceous Plants	Woody Plants		
					size	
	e	Stature DM (dimethomorph)	6.4 oz/100 gal	12.8 oz/100 gal	Apply at 14 d intervals	SePRO, Todd Bunnell, 317-580-8097, toddb@sepro.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		Special Application Instructions	Contact Information to obtain materials and any needed adjuvants
			Herbaceous Plants	Woody Plants		
B		Alude	12.7 fl oz/100 gal	12.7 fl oz/100 gal	Drench: Apply 1 pint per sq ft. Repeat at 28 d intervals.	Cleary, Rick Fletcher, 732-329-8399, rick.fletcher@clearychemical.com
B		BioPhos	64 fl oz/100 gal	64 fl oz/100 gal	Apply at 2 pts per sq ft	AgBio, Jan Meneley, 303-469-9221, agbio@agbio-inc.com
B		Heritage (azoxystrobin)	4 oz/100 gal	4 oz/100 gal	Apply 4 oz/6 inch pot	Syngenta, Dave Ross, 336-632-6411, david.ross@syngenta.com
B		Insignia (Pyraclostrobin)	8 oz/100 gal	8 oz/100 gal	Must use a minimum of 200 ml spray volume in a 6" standard pot. Drench directions state: Drench at half volume is equal to a volume of fungicide solution that replaces the top half of the volume of water/air-filled pore space of a given potting media in a given pot at field capacity. 200 ml is considered the minimum required or half volume 400 ml is considered the full volume or maximum drench column required.	BASF, Kathie Kalmowitz, 919-785-9659, kalmowk@basf-corp.com
B		Magellan	Foliar application: 1.25 – 4 pints per 100 gal Drench application: 6 – 12 fl oz/100 gal	Foliar application: 2 – 5 pints per 100 gal Drench application: 6 – 12 fl oz/100 gal	Do not exceed one application every 14 days for bedding plants or every 30 days for conifers Apply 2 pints solution per sq ft. Repeat at 28 d intervals	Nufarm, Jim Fickle, 708-205-0255, jim.fickle@us.nufarm.com
B		<i>Muscodor albus</i>	7.5 grams per liter soil volume	7.5 grams per liter soil volume	Apply after pathogen inoculation	AgraQuest, Brett Highland, bhighland@agraquest.com
B		TM-473 480SC	3 oz/100 gal	3 oz/100 gal		Arysta, Doug Houseworth, 904-321-0795, LHhouse9@aol.com
B		Vital	2 - 4 pints / 100 gallons on a 14 day interval	Drench application: 4 pints /100 gallons per 400 sq.ft. repeat every 30 days.		Luxembourg Industries, Vince Morton, 336-286-9714, mortv@aol.com

Priority	#	Product	Rates		Special Application Instructions	Contact Information to obtain materials and any needed adjuvants
			Herbaceous Plants	Woody Plants		
				Foliar application: 4 pints /100 gallons apply every 14 days.		
C		Actinovate	10 oz/100 gal	10 oz/100 gal		Natural Industries, Matt Kowalski, 888-261-4731, mattk@naturalindustries.com