

Project Name: **Non-Oomycete Root and Crown Rot Efficacy – Thielaviopsis Efficacy**

New		Ongoing		Completed		Duration if ongoing or completed:	2012-2013, 2018-2021
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**Project Description:**

This project arose out of the 2011 IR-4 Environmental Horticulture Workshop as one of several projects focusing on root diseases. *Fusarium* and *Pythium* were the two pathogen genera chosen for study. *Fusarium* species can infect roots, crown and stems causing root and crown rots and canker diseases. Subsequently, nonoomycete root and crown rot diseases became a high priority project starting in 2018.

**Research Project Abstract (if available):**

*Abstract from 2021 Thielaviopsis Literature Review*

From 2003 to 2020, numerous products representing 35 active ingredients were evaluated in greenhouse experiments as soil drenches against *Thielaviopsis basicola* causing black root rot on environmental horticulture crops. Although there were insufficient data for definitive conclusions, two experimentals (Avelo - mefentrifluconazole) and A20808C showed promising efficacy comparable to the standards. Several products that are not yet labeled for *Thielaviopsis basicola* also showed promising efficacy in single trials. These include Empress Intrinsic (pyraclostrobin), Endorse/Veranda O (polyoxin D), Mural (azoxystrobin + benzovindiflupyr), Stargus (*Bacillus amyloliquefaciens* strain F727). Tourney (metconazole) and Vital (potassium phosphite). A newly registered fungicide Picatina Flora (pydiflumetofen + fludioxonil) provided excellent efficacy in a single experiment; however, it is not yet available commercially. The established standards 3336 and Terraguard generally provided excellent efficacy.

**Target Species (Phytotoxicity, or common and Latin name of arthropod, pathogen, weed):**

Thielaviopsis Root Rot (*Chalara elegans*)

**Target Crops (list tested crops if ongoing or completed project)**

<i>Calibrachoa sp.</i>	<i>Petunia x hybrida</i>	<i>Viola X wittrockiana</i>
<i>Catharanthus roseus</i>	<i>Viola sp.</i>	

**Target Product(s)(list tested products or numbered compounds if ongoing or completed project)**

3336 EG (Thiophanate-methyl) 3336 F (Thiophanate-methyl) 3336 WP (50%) (Thiophanate-methyl) Astun (isofetamid) Avelo Fungicide (Mefentrifluconazole) Broadform SC500 (Fluopyram + Trifloxystrobin) BW161N (BW161N) MBI 121 (MBI 121) MBI 601 (Muscodor albus) Mural WDG (Azoxystrobin + benzovindiflupyr) OHP 6672 4.5L (Thiophanate-methyl) Orkestra Intrinsic (Fluxapyroxad + pyraclostrobin)	Picatina (Pydiflumetofen) Picatina Flora (Pydiflumetofen + fludioxonil) Postiva (pydiflumetofen + difenoconazole) Pvent (Gliocladium catenulatum Strain J1446) SP2478 (SP2478) SP2700 AS (SP2700) SP2700 WP (SP2700) Stargus ( <i>Bacillus nakamurai</i> strain F727) Switch 62.5WG (Cyprodinil + Fludioxonil) Tril-21 (Thyme oil) TXC2020 (Thyme oil) Zio ( <i>Pseudomonas chlororaphis</i> strain AFS009)
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**Product Registration and Research Status**

	Fully Screened (also includes standards)	Partially Screened through IR-4 <sup>1</sup>	Need Data Across Species ?
Labeled Generally & Commercialized	3336 Medallion	Orkestra Tourney Trinity *	Disarm Pageant Intrinsic Hurricane Palladium



# Environmental Horticulture Program Research Project Sheet

<https://www.ir4project.org/ehc/ehc-registration-support-research/env-hort-extension-resources/>

			PlantShield, RootShield <b>RootShield Plus *</b>
Labeled Generally But NOT Commercialized			
Labeled for Specific Diseases & Commercialized	Terraguard	Heritage	26/36 Chipco 26019 <b>Empress Intrinsic *</b> MycoStop Trinity SC
Labeled for Specific Diseases but NOT Commercialized			Picatina
Not yet registered or Labeled			BAS 750 Compass O Insimmo MBI 601 Promax SP2550 SP2770 Torque
No longer available for development		CG100 SP2169	

\* IR-4 Data contributed to registration decision – either adding pest to label or not pursuing further research  
1 At least one species screened fully

PROS	CONS
New unregistered active ingredients	Biopesticides better as preventative
Wide range of FRAC mode of actions to test, including biologicals	Multiple applications considerations required
New unregistered active ingredients	
Alternative application methods	
Loss of methyl bromide – need alternatives	
Thielaviopsis root diseases remain major issues	
<b>Comments:</b> IR-4 focused resources on Rhizoctonia and Fusarium during 2022 and 2023; identification of new efficacious tools still warranted.	

### IR-4 Efficacy Trials to Date

Average rating on a scale of 1 – 5 with 1 = 0 to about 50% efficacy (not effective) and 5 = 95 to 100 efficacy (very effective); minimum to maximum rating; number of trials (See table on next page). For product/insect combinations that are blank, IR-4 has not screened this combination.

'Labeled' indicates that this disease species or genera is listed on the label. A rating of 2 or lower is considered unacceptable efficacy (*red text*). A rating of 3 or higher is considered commercially acceptable (black text). Non-labeled, completed product/disease combinations (3 or more trials) with an average rating of 3 or higher are highlighted with *green text*. For disease/product combinations that are blank, IR-4 has not screened this combination.

MOA Class	Product (Active Ingredients)	<i>Chalara elegans (aka Thielaviopsis)</i>
FRAC 1	3336 F (Thiophanate-methyl)	<b>3.0 (3 - 3) n1</b>
FRAC 1	3336 WP (50%) (Thiophanate-methyl)	<b>3.0 (3 - 3) n1</b>
FRAC 1	OHP 6672 4.5L (Thiophanate-methyl)	<b>4.0 (4 - 4) n2</b>
FRAC 3	Avelyo Fungicide (Mefentrifluconazole)	3.0 (1 - 5) n4 Labeled
FRAC 7	Astun (isofetamid)	<b>1.0 (1 - 1) n2</b>
FRAC 7 + FRAC 11	Broadform SC500 (Fluopyram + Trifloxystrobin)	<b>1.0 (1 - 1) n2</b> Labeled
FRAC 7 + FRAC 11	Orkestra Intrinsic (Fluxapyroxad + pyraclostrobin)	<b>1.0 (1 - 1) n2</b>
FRAC 7 + FRAC 3	Postiva (pydiflumetofen + difenoconazole)	<b>1.5 (1 - 2) n2</b>
FRAC 9 + FRAC 12	Switch 62.5WG (Cyprodinil + Fludioxonil)	<b>3.0 (3 - 3) n1</b>
FRAC BM01	TXC2020 (Thyme oil)	<b>1.0 (1 - 1) n2</b>
FRAC BM02	MBI 601 (Muscodor albus)	<b>1.0 (1 - 1) n2</b>
FRAC BM02	Pvent (Gliocladium catenulatum Strain J1446)	<b>2.0 (1 - 3) n2</b>
FRAC BM02	Zio (Pseudomonas chlororaphis strain AFS009)	<b>1.0 (1 - 1) n2</b>
IRAC UNF & FRAC BM02	Stargus (Bacillus nakamurai strain F727)	<b>2.0 (1 - 3) n2</b> Labeled
unknown	BW161N (BW161N)	<b>1.0 (1 - 1) n2</b>
unknown	MBI 121 (MBI 121)	<b>1.0 (1 - 1) n2</b>
unknown	SP2700 WP (SP2700)	<b>1.0 (1 - 1) n2</b>