

# PYTHIUM/PHYTOPHTHORA ROOT ROTS

## *Control Strategies*



### **Background:**

Pythium infects a wide host range and is more common in the greenhouse. Phytophthora is less common in the greenhouse and more common in the nursery and is more host-specific. Phytophthora has been shown to be more aggressive than Pythium. Both of them can survive for many years in the soil and on debris in the greenhouse. Pythium and Phytophthora are referred to as the water molds and they are both in the family Pythiaceae.

### **Symptoms:**

Pythium can cause damping off, and crown/stem rots. Phytophthora causes root/crown rots as well as foliar blight. Symptoms on the leaves are the first to show because the roots are too compromised to take up the nutrients needed for the plant. The leaves could be yellow, stunted or wilted. When the roots are examined they will be soft and mushy and may appear to be water soaked, glassy, and dark brown. The outer covering of the root will separate easily from the inner root by gently pulling on it and it will appear slimy. Healthy roots are white and hard, so it is very easy to tell when you have Pythium or Phytophthora. To differentiate between the two though a sample will need to be sent to a lab for identification.

### **Favorable Development Conditions/Disease Cycle:**

The favorable conditions for Pythium and Phytophthora are wet soils, mild temperatures, high soil EC and low oxygen in the soil. They can be spread by fungus gnats and shore flies. They can also be spread by using spore contaminated media, supplies or water. Recirculation of contaminated irrigation water in an irrigation system can spread the disease as well. The spores can last a long time until the roots are stressed and then that allows the spores to infect the roots and then the disease will spread.

### **Cultural Control:**

Previously used pots or supplies need to be washed and disinfected before use. If using field soil, have it disinfected before use. Throw away infected plants as soon as possible to limit the spread of the disease. If using recycled irrigation water, have it tested and treat if necessary. Sanitation of all areas is key to limiting the spread of the disease.

### **Chemical Control:**

There are a number of fungicides that are labeled and are effective for Pythium/Phytophthora root rots. Some species of Pythium in the greenhouse have been shown to be resistant to Subdue Maxx. All fungicides for Pythium and Phytophthora control should be applied as a drench.

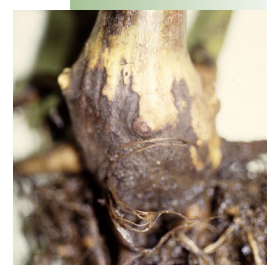
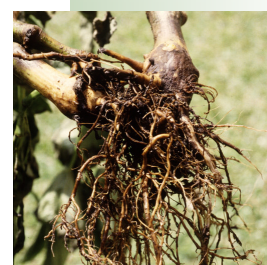
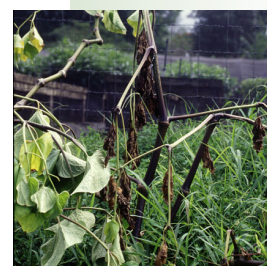


*Always read and follow label directions before applying any pesticide and follow state and local regulations*

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## **Empress 24oz** BAS59014402



(Pyraclostrobin) Group 11. Warning. 12hr REI. Rate: 1-6oz/100gal. Contact. Labeled for use in the greenhouse and nursery, and on fruit and nut trees. Do not use on grapes, nine bark, and wintercreeper.



## **Terrazole 35WP 2lb** OHP988472



(Etridiazole) Group 14. Caution. 12hr REI. Rate: 3.5-10oz/100gal. Contact. Labeled for use in the greenhouse and nursery.



## **Segway O 16oz** OHP987200 64oz OHP987245



(Cyazofamid) Group 21. Caution. 12hr REI. Rate: 1.5-6oz/100gal. Contact, Limited Systemic. Labeled for use in the greenhouse and nursery, as well as on some vegetables and herbs.



## **Aliette WDG 5lb** BYR84956465



(Aluminum Tris) Group 33. Caution. 12hr REI. Rate: 6-12oz/100gal. Systemic. Labeled for use in the greenhouse and nursery, as well as on some vegetables and herbs.



## **RootShield Plus WP 1lb** BW2HR45A02 3lb BW2HR45A03 30lb BW2HR45A07



(Trichoderma harzianum Rifai strain T-22, Trichoderma virens strain G-41) OMRI Group BM-02. Caution. 4hr REI. Rate: 3-8oz/100gal. Contact. Labeled for use in the greenhouse and nursery, as well as on fruits, vegetables, herbs, and tree nuts.



## **Adorn 32oz** VAL61510.928



(Fluopicolide) Group 43. Caution. 12hr REI. Rate: 1-4oz/100gal. Locally Systemic, Translaminar. Labeled for use in the greenhouse and nursery. Should trial for phytotoxicity on plants not on label prior to use. Adorn must be tank mixed with another product labeled for Pythium/Phytophthora for resistance management.



## **Subdue Maxx 1gal** SYN53195 32oz CH149



(Mefanoxam) Group 4. Caution. 48hr REI. Rate: 0.5-1oz/100gal. Systemic. Labeled for use in the greenhouse and nursery.



## **Phostrol 2.5gal** NTS10264225



(Mono and dibasic sodium, potassium, and ammonium phosphites) Group 33. Caution. 4hr REI. Rate: 5-10oz/100gal. Systemic. Labeled for use in the greenhouse and nursery, as well as on vegetables, fruits, and herbs.