Pythium

Root loss can be caused by many organisms including fungi, bacteria and nematodes as well as environmental conditions like high soluble salts, incorrect pH, excess water and phytotoxicity. Diagnosis can be very challenging and should be lab-based to avoid treating the wrong problem. Symptoms of *Pythium* root rot include damping-off, wilting, yellowing (lower leaves especially), leaf drop and stunting. Roots are often mushy, brown and soft and their outer tissues can slough off leaving the central core only.

Pythium is a member of the water mold diseases, and are most severe when water is excessive. Mobile spores (zoospores) can move with water, hence the name water molds. Temperatures that promote disease can be cool to hot depending on the species of *Pythium*. *Pythium* can infect roots, stems and leaves, but the most common site is the root zone. To minimize infections, growers should avoid excess nitrogen, high soluble salts (root burn) and provide for good drainage by using the best potting medium possible. It is is also important to control fungus gnats and shore flies since they can spread the spores and provide entry wounds for the pathogens by the feeding of their larvae.

Sanitation and good drainage are critical to controlling diseases caused by *Pythium*. They secrete enzymes which kill tissue and provide more food for the pathogens. Infection patterns will usually follow water movement. For instance, low areas in a shade house that have standing water will be the first to show root loss due to *Pythium*. If possible, keep pots off the floor and avoid situations where they are sitting in water. Selecting media that drains well is critical for control.

Control is difficult and most fungicides are better at protection than eradication. However, Terrazole L and Terrazole 35% WP have curative action on existing *Pythium* infections. When conditions are favorable for root rots, it is very important to use a fungicide rotation program to manage these diseases as part of a fungicide resistance management program. Treatments under favorable conditions for disease development are generally applied at 14 - 28 day intervals. Remember it is always best to apply a fungicide at the site of the problem. Root diseases are best treated with drenches.

Brown rotted roots on gardenia cuttings

One calibrachoa plug in a basket showing stem and root rot due to *Pythium*

Close-up of root collapse on calla due to *Pythium*

(Photos courtesy of A. Chase)

OHP Products Registered for *Pythium* Root Rot Control

Products	Chemical Class	MOA	Residual Control	REI
Aliette® WDG	Ethyl Phosphonate	33	30 days	12
FenStop®	Imidazolinone	11	14 days	12
Segway® O	Cyano-imidazole	21	7 to 28 days	12
Terrazole® L or Terrazole® 35% WP	Thiadiazole	14	28 days	12
Triathlon® BA	Biopesticide	NC	7 to 14 days	4

Suggested Prescription Solution Program for *Pythium* Root Rot

Prevention

Product	Rate per 100 gallons	Remarks
1.) **Terrazole® L or Terrazole® 35% WP**	3.5 to 6 fl. oz. 3.5 to 10 oz.	drench volume specific to pot size
2.) **Triathlon® BA**	0.5 to 4.5 pints	drench - preventative ONLY
3.) **Segway® O**	1.5 fl. oz.	drench to wet the upper ½ of growing media
4.) **Aliette® WDG**	12.8 oz.	drench - monthly interval

Eradication

Product	Rate per 100 gallons	Remarks
1.) **Terrazole® L or Terrazole® 35% WP**	10 fl. oz. 10 oz.	drench volume specific to pot size
2.) **Aliette® WDG**	2.5 lbs.	foliar spray
3.) **Segway® O**	3 fl. oz.	drench to wet the upper ½ of growing media
4.) Subdue® MAXX®	1 to 2 fl. oz.	drench – rate dependent on crop, see label 14 to 28 day interval

TBS = tablespoon tsp = teaspoon mL = milliliter 1 fl oz = 29.6 mL 1 tsp = 5 mL

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