

Pythium Root Rot on Poinsettias

The holidays are rapidly approaching and with them the last poinsettia will be shipped or trashed. Many a grower will rejoice in this event, as their greenhouses are once again free of this difficult crop. The diseases of poinsettia are no worse than those of many other crops but the timing issue makes it a hit or miss event.

One of the most common diseases of poinsettias is Pythium root rot and black leg. The cause of disease is either *Pythium aphanidermatum* or *Pythium ultimum*. Disease often starts during rooting of the cuttings and in ebb and flood systems can rapidly spread throughout the crop (Figure 1). These fungi are soil-borne and spread via irrigation water, use of contaminated potting media, pots and rooted cuttings. Roots appear water-soaked and are mushy and disintegrate when handles. A soft, watery rot anywhere on the cutting stem is also a sign of Pythium infection.

In the cutting phase, symptoms are easily confused with other cutting diseases including Rhizoctonia stem rot and Erwinia blight. Erwinia is usually easy to distinguish since cuttings fall apart and completely collapse into a slimy mass within a couple of days. The characteristic rotten fishy odor is usually present when Erwinia has caused the disease. There are no reliable, clear-cut differences in symptoms from *Rhizoctonia* or *Pythium*. Since control strategies differ significantly, you must obtain a diagnosis to choose the correct path.

Sometimes, *Pythium* appears late in crop production when the plants are close to finishing (Figure 2). In such cases the plant wilts (sometimes only one stem in a pot with multiple cuttings). The roots again appear watery, mushy and gray-black. Be sure to check the roots since many times a wilted plant is watered when that is the last thing it needs. Of course, losses at this stage are especially expensive.

Cultural effects

The temperature optimum was 86F for *P. aphanidermatum*. Disease caused by *P. ultimum* was worst at 62F and caused no serious damage at 80F. This makes controlling temperature difficult since the two species known to affect poinsettia do not have the same optimal temperatures. Pythium root rot in the warmer times of the year or in warmer parts of the country may be due to *P. aphanidermatum* while that later in the season or in cooler climates is probably due to *P. ultimum*.

There has been quite a bit of research done on controlling this disease with focus on cultural conditions that promote Pythium root rot a special focus. Disease has been found worse at pH above 5.5. Keeping the pH lower will help reduce severity. Disease increased 100% with a pH change from 4.5 to 6.8.

Disease severity increases as fertilizer application increases from 100 ug N/g to 300 ug N/g and is even higher at 600 ug N/g. Plants potted in peat-vermiculite appeared more

sensitive to high soluble salts than those in other media. The moisture holding capacity of the potting medium is also critical. Moist holding capacity above 70% seriously increased *Pythium ultimum*. Use of highly decomposed peat (dark) results in worse Pythium root rot (*P. ultimum*) compared to medium or light peat that is not greatly decomposed.

Chemical and Biological control

Rootshield (also called PlantShield - *Trichoderma harzianum*) worked better than SoilGard (*Gliocladium virens*) but was less than Banrot (thiophanate methyl and etridiazole) when used as a drench at 12 oz/100 gal. Poinsettia cuttings in root cubes soaked in Subdue (metalaxyl) had slightly reduced root development but not as much as other fungicides tested. Trials on poinsettias with Pythium root rot showed that Heritage (azoxystrobin) and RootShield did not control the disease. Subdue was effective even under high disease pressure.

Figure 1. Typical symptoms of Pythium root rot on cuttings.



Figure 2. Wilting of large poinsettias caused by Pythium root rot

