

# CONTROLLING POINSETTIA ROOT ROT

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Poinsettias, as grown by commercial flower growers, are prey to a very limited number of diseases. In contrast with chrysanthemums, for example, which in the past are commonly affected by at least 10 or 12 diseases in every imaginable category, poinsettias are commonly affected only by a few root rot fungi, rarely by a bacterial canker, and, in southern gardens, by a fungus disease known as scab. The lack of numbers, however, is more than made up by the damage done by the few, and of the few, the root rots are of greatest concern to the commercial florist.

## Symptoms of Root Rot

Above ground, the presence of root rot may be indicated by several symptoms. With young plants there usually is a marked upward curling of the leaves, followed by abscission or dropping progressively from the base upward. Sometimes there is a more definite wilting of the leaves and they may hang downward on the stem for a considerable time before dropping. The stems of affected plants commonly become quite red, in contrast to the green or yellow-green of healthy plants. If plants are severely affected when young they usually fail to produce salable plants for Christmas. If plants are only slightly affected when young or if infection occurs late in the season, growth may appear normal until after the bracts form and then, under certain conditions, the leaves may curl and drop just a few weeks before Christmas.

Below ground, as the name of the disease indicates, the roots are partly or completely rotted. The stem at or below the soil line may be partly rotted, may show longitudinal cracking, or may be perfectly sound, depending on which root organism is involved.

## Causes of Root Rot

Root rot of poinsettias may be caused by any one of 3 soil fungi, *working under specific soil and climatic conditions*. In our experience the most common, and least easily controlled, rot is that caused by the fungus *Thielaviopsis basicola*. Probable reasons for its prevalence include the facts (1) that it may cause disease over a very wide range of temperature, although it is most serious at low temperatures, (2) that it apparently may operate over a wide range of soil moisture conditions, (3) that it produces abundant spores which may be spread very easily by splashing, unsanitary culture, etc., and (4) that it is not controllable by any fungicides thus far tested. It is restricted by acidity, but only at pH values of about 4.5 or below. Many strains of *Thielaviopsis* will not attack poinsettias, but virulent poinsettia strains are very widely distributed and probably have been introduced to nearly all greenhouses in which poinsettias have been grown for any length of time. This fungus will almost invariably be found to be present if there are longitudinal black cracks in the base of the stem below soil line. Lack of such cracks, on the other hand, does not necessarily mean that *Thielaviopsis* is not present.

Another fungus often involved is known as *Pythium*, the species *P. ultimum* apparently being most commonly implicated. In our experience this fungus usually rots the roots back to the stem, but only rarely does it actually attack and rot the stem. In some cases the top of the plant may be killed, but sometimes, if the root is partially checked, it is only stunted. Reasons why this fungus, in our observations, has been less common and serious than *Thielaviopsis* might include the following: (1) its capacity to produce poinsettia root rot is greatly reduced as the temperature increases over the normal growing range; (2) its activity may be sharply checked at reduced soil moisture levels; (3) although *Pythium* may produce spores, we doubt that they could possibly be produced in similar abundance or spread as readily as those of *Thielaviopsis*; and (4) it is somewhat responsive to control by chemicals applied to the soil. Whether or not poinsettias are susceptible only to specific strains of *Pythium* has not to our knowledge been studied, but present evidence suggests that this is not the case and that strains capable of attacking poinsettias may be very widely distributed in field soils.

A third fungus which often is associated with poinsettia root rot is *Rhizoctonia solani*. It may cause some rotting of the roots but is best known as a stem rotter, attacking the stem at the soil line, then working upward and downward to a limited extent. This attack normally is limited to cuttings, young plants in small pots, or older plants soon after panning. The attacked plants usually are killed outright fairly early in the season so that losses may be counted well before Christmas. This fungus is less common and serious, in our opinion, because (1) it is virulent only at high temperatures, (2) it produces few, if any, spores and hence is less readily spread by splashing, and (3) its spread in the propagating bed or pan may be completely checked by a chemical drench. With *Rhizoctonia*, strains of different degrees or virulence to poinsettias exist but, as with *Thielaviopsis* and *Pythium*, poinsettia-attacking strains are well distributed.

## Root Rot can be Controlled

Serious losses from poinsettia root rot can be controlled—*if we make full use of our knowledge*.

First, make the environment work for you as much as possible. Prepare a light, well-drained soil which cannot become water-logged. We suggest a mixture of  $\frac{1}{3}$  soil,  $\frac{1}{3}$  sand,  $\frac{1}{3}$  peat or one of the UC-type mixes of peat and fine sand. Be sure that the drainage in the pots does not become clogged. A handful of sterilized coarse crushed rock usually serves the purpose. Do not put the pots or pans on a soil bed, but rather use a layer of coarse gravel in the beds or benches— or leave them bare. Then you

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may—and should—water very frequently with no fear of “drowning” the roots.

Temperature-wise, the poinsettias should be grown at the highest possible temperature consistent with good growth, but Rhizoc can be completely controlled by sterilization and/or chemical treatment.

Second, carry out the best possible sterilization and sanitation program. Soil for potting and panning preferably should be steamed, and the job must be thoroughly done. Be sure that the temperature reaches 160°F in the coldest corners. The potting bench also must be sterilized. The suggestion made some years ago of having a piece of transite or other hardboard which can be taken outside and thoroughly washed with a 1 to 50 formaldehyde solution is a good one. All pots should be new or thoroughly sterilized. The use of peat pots for the rooted cuttings is suggested since, although not sterile, they probably do not carry poinsettia pathogens. To carry this even further, the cuttings might be well rooted right in the peat pots. The less the plants are handled, the less the chance of introducing contamination. Benches upon which the small pots, and later the pans, are placed must be sterilized, preferably by steaming. Chemical drenches are better than nothing but are not as good as steaming. A mixture of captan, Terraclor and ferbam has given fairly good results at about 1 pound each per 100 gallons. Also, Panogen 15 seed disinfectant at 1½ fl. oz. per 100 gal. and Panodrench 4 at 5 fl. oz. per 100 gal. have looked promising.

Sanitation is important throughout the culture of the crop, but particularly in the early stages. Workmen should be required to wash hands with soap and water before potting or otherwise working with the poinsettias, ends of hose should be kept up off the walks, tools used in poinsettia soil should be sterilized or *thoroughly scrubbed* with soap and water before using in poinsettia soil, etc.

Third, chemical treatments may be used in certain phases of the program. Terraclor (pentachloronitrobenzene) is highly specific against Rhizoctonia. Since this fungus is particularly aggressive in sterilized soil, we suggest that about 1 to 3 days after planting in small pots and again immediately after panning the soil be flooded with a suspension containing ½ lb. Terraclor per 100 gal. (approximately 1 tablespoon to 2 gal.). This treatment will prevent any spread of Rhizoc, but will have little or no effect against Pythium or Thielaviopsis. Since captan offers some degree of control against Pythium, this material, at 1 lb. per 100 gal., has often been added to the drench. The value of the captan supplement against Pythium in this sort of treatment remains somewhat in question but is inexpensive and may be worth trial. No chemical treatment has proved effective against Thielaviopsis in our tests.

Practical control of poinsettia root rot thus depends on a 3-pronged program: making maximum use of climatic and soil conditions, which suppress the disease, carrying forward the best possible sterilization and sanitation program, and utilizing a proven chemical treatment. Carefully carried out, such a program will keep root rot losses at an absolute minimum, if not eliminate them altogether.