

## **Pythium and Fusarium Fungi: Diagnosing, Preventing & Treating**

**By Richard Carroll**

When you look at your roses and one doesn't perform as well as its neighbor, what do you do? Most people try the shotgun approach. Hey, try fertilizing, spraying, watering. If this doesn't work they may just pull the plant up and throw it away without finding out what was wrong or if there is a disease that will live in the soil and stay dormant until something happens.

You need to think of that rose as you would your body. A doctor would ask your history and run tests and examine you. On a rose you need to do the same thing; examine it but also find out the history. When was it fertilized and how much? What sprays were used on the rose or what was sprayed in that area or was some other chemical used in that sprayer tank prior to spraying? Are there any deficiency or disease symptoms? Bottom line: you can't take anything for granted.

A lot of people think that the only fungal diseases that roses get are blackspot and mildew. There are many other fungi that can hurt your plant but, unless you are growing thousands of one particular plant, you wouldn't necessarily run across them. There are, however, some fungi that are prevalent such as pythium and fusarium.

These fungi are soil-borne and they attack the roots and move on up the stems. They like a pH of 4.5-6.0 with temperatures of 60-90 degrees Fahrenheit and moist conditions. Roses like the same conditions.

Other problems can help set up a scenario that can lead to the development of a fungus. The pH can prevent the uptake of fertilizer in soil solution, which can cause stress to the plant. Stress can also occur when a shade tree extends its roots into the rose garden or when a container plant is grown too long in a small pot or needs to be root pruned. Roses like their soil to have good drainage. Too much compost, hardpan or clay in the soil will slow down the drainage and can

cause these fungi to flourish.

Too much water or poor water quality can also cause these fungi to grow. Poor water quality can tie up the fertilizer as well. It is better to do deep watering less often as the roots will then try to get to their water source. Frequent light watering makes the roots stay toward the top of the soil and not penetrate to find water. This also provides a better environment for the growth of pythium.

You may have favorable conditions during the year that cause fungus spores to grow or just remain dormant. They may stay inactive for six months to a year and when the plant becomes stressed or has a problem that sets it back, such as a fertilizer burn or an outbreak of spider mites, the fungus becomes active and finishes killing the plant.

Pythium is hard to detect and expensive to cure so it is better to manage growing your roses with prevention rather than seeking a cure. When buying a rose make sure it has a good root system. 'Fortuniana' grafted plants are usually weaker-rooted than those on 'Dr.Huey' [Ed. Note: *Because the 'Fortuniana' root system is more dense and the roots much finer, they are more sensitive to excessive water. However, as we have seen, they are better able to handle our heat and result in much stronger plants.*]

As a nurseryman, I have received plants that were already infected and have treated them within twenty-four hours. I did not sell them for three weeks to make sure the roots were growing fine. When I suspect a problem, I will remove the plant from the pot and look at the fine young roots. The fine feeder roots should be a good white coloring, not brown or rotten looking with a stagnant or moldy smell and/or the outer layer rotting off. If the fine feeder roots are black or brown, don't buy the plant, because you could infect your other roses. Also look at the top growth. Is it growing rapidly with lots of new growth or is it stagnant? Some potted roses are pushed to market with the use of liquid fertilizers and when they have been there for a couple of

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weeks, they stall out or start to go backwards. Fusarium and pythium can be brought on by stress to the plant whether it is from lack of fertilizer, an outbreak of blackspot or mildew or weed killer exposure.

These fungi will show up in different ways. Fusarium sometimes will start within a limb, be dark, expand in both directions and look like die back. Other times it looks like dieback that cannot be controlled. Often gardeners try to trim it out only to discover that they have let it get too far and it has killed the rose. Pythium can kill the roots and make a plant look like it isn't getting enough water because there are not enough roots to support the top. When the roots die it is usually because of suffocation as oxygen becomes limited in the root zone. The dead roots encourage more soil fungus and cause further decline and problems.

Subdue is the best fungicide to treat these soil-borne fungi. It will usually last about thirty days before you have to re-treat. Once you have new roots on a recovering plant you can add manure or a catalyst to encourage more roots to grow and this will help the rose come out of its slump. Once you have the roots to support the top, you can begin with a complete fertilizer to keep the plant healthy. By a complete fertilizer, I mean one with all of the minor elements that help to keep the plant healthy and more resistant to disease.

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Left, A) Seedling lesion caused by Pythium. Lesions are often reddish brown.

*the Tidewater (Virginia) Rose Society, Albert N. Williams, editor.*

**Ed. Comments:** In addition to Pythium and Fusarium, we have Phytophthora, all of which are species of some of the common root rots. We are especially prone to these diseases as the soils warm up during the monsoon season. Conditioning soils with good compost, maintaining a pH range of 6 to 7 and good fertilization also seem to help plants resist the various diseases.

#### **DAMPING OFF**

**Symptoms:** A soil-borne fungal disease that affects seeds and new seedlings, damping off usually refers to the rotting of stem and root tissues at and below the soil surface. Usually, the plants will germinate and come up fine, but within a few days they become water-soaked and mushy, fall over at the base, and die. The disease attacks many plants and is common throughout the United States.

Several fungi can cause decay of seeds and seedlings, including species of *Rhizoctonia*, *Fusarium* and *Phytophthora*. However, species of the soil fungus *Pythium* are most often the culprit. Damping off typically occurs when old seed is planted in cold, wet soil, and is further increased by poor soil drainage. High humidity levels, rich potting soils and planting too deeply will also encourage its growth.

Fungal spores live in the soil and are primarily a problem in seed beds. They can be transported on garden tools and in garden soils taken into the house or greenhouse.

**Note:** Older plants are rarely killed by damping off primarily because the production of secondary stem tissue forms a protective barrier and limits fungal penetration.

#### **Damping off of seedlings**

