

Damping-off Fungi

This is an exciting time for any gardener, as we watch our new plants begin their journey to fruition or flowering. However, many seedlings have their lives snuffed out before our eyes due to a treacherous fungal complex, the damping-off fungi. This year's cool, moist conditions are going to likely increase the degree of outdoor-grown plant problems caused by this disease.

Damping-off can be caused by a number of different fungi, but is primarily due to one of the Pythium or Phytophthora species. The classical manifestation of this disease is a water-soaked lesion area that circles the seedling's stem at the soil line. This lesion causes the seedling to wilt and then simply keel over at the soil line and die. There is no hope for a seedling once it has been infected, as the disease is a very quick killer. However, this is not the only way that this disease causes problems, as it also causes seeds to rot before they germinate, causes seedlings to not be able to emerge at all, and can infect adult plants, leading to potentially severe stunting and loss of productivity. The way to remember this disease complex might be that it is simply a root/crown rot that infects really early. The seedling simply isn't strong enough to overcome them, as many more mature plants are.

This disease complex is usually more prevalent in inside vs. outside situations, but can be very severe in either situation. Outside, it will be worse if the soil is kept wet, the plants are under stress of some sort (too high or too low temperature, low nutrient availability, high weed populations), there is an excess of nitrogen in the soil, or if the same plant species has been planted in the same area multiple years. Inside, it will be worse in high humidity, low air-flow situations, especially if using non-sterile soil mixes and the water source is via top-down watering or irrigation.

What to do? Well, don't despair, there are a number of possible control and/or protection mechanisms that you can utilize to attempt to fight off these evil invaders of your young, innocent, virtuous plants.

PREVENTION: In the garden, you should make sure to have good soil drainage, try to keep plants in a space with good airflow, and plant seeds or transplants when growth conditions are optimum. In a year like this when we have excess soil moisture, planting in bare soil vs. covered soil (compost, newspaper, whatever) is likely a good idea, at least until the plants get up and growing. Inside or in greenhouses, you need to start off with sterile soil or soil-less media, provide good growing conditions, have the surface of your soil near the top of the containers so that the soil line region receives good airflow, make sure all of your equipment, pots, etc... have been sterilized before using them, and avoid overwatering. One other idea that has shown merit is the use of composted bark instead of peat in starting mediums.

Lastly, you need to remember that the causal organisms of this disease are soil-borne. Once they are in your soil, they will essentially always be there. Rotation will be effective in minimizing their occurrence, but you will never be able to eradicate them.

CONTROL: There are many practices that one can utilize to further fight damping-off. You can start with seed treatments, of which there are many possibilities, ranging from chemical fungicides to antagonistic fungal organisms to soaking seeds in a small amount of water with two crushed garlic cloves (I'll be honest, I don't remember where I saw that last one, but remember that it worked for them, but note that I am not recommending it, just mentioning it.) There are also many types of seedling treatments, again ranging from fungicides such as captan, metalaxyl, thiophanate-methyl or soluble coppers to the use of antagonistic biological control organisms such as Gliocladium, Streptomyces, or Trichoderma. Greg P. has also mentioned that cinnamon works well in this regard, sprinkled on top of the soil.

The various treatments will usually work well against one of the organisms or maybe two, but not against all of them. So, if you have had problems in the past, it may pay to actually analyze the fungus to know which organism is doing the damage so that you can select the proper control mechanism.