

Learn more

Common Diseases of Plants

Damping-Off Diseases

What Is Damping-Off?

Damping-off is a disease that commonly affects new plants. Specifically, it affects seeds, seedlings, and root systems either pre- or postemergence.

When damping-off occurs before a seedling sprouts, in the preemergence stage, the seed rots. If damping-off occurs postemergence, the seedling will collapse after sprouting. This affliction can occur in nurseries, on farms, in greenhouses, or gardens.

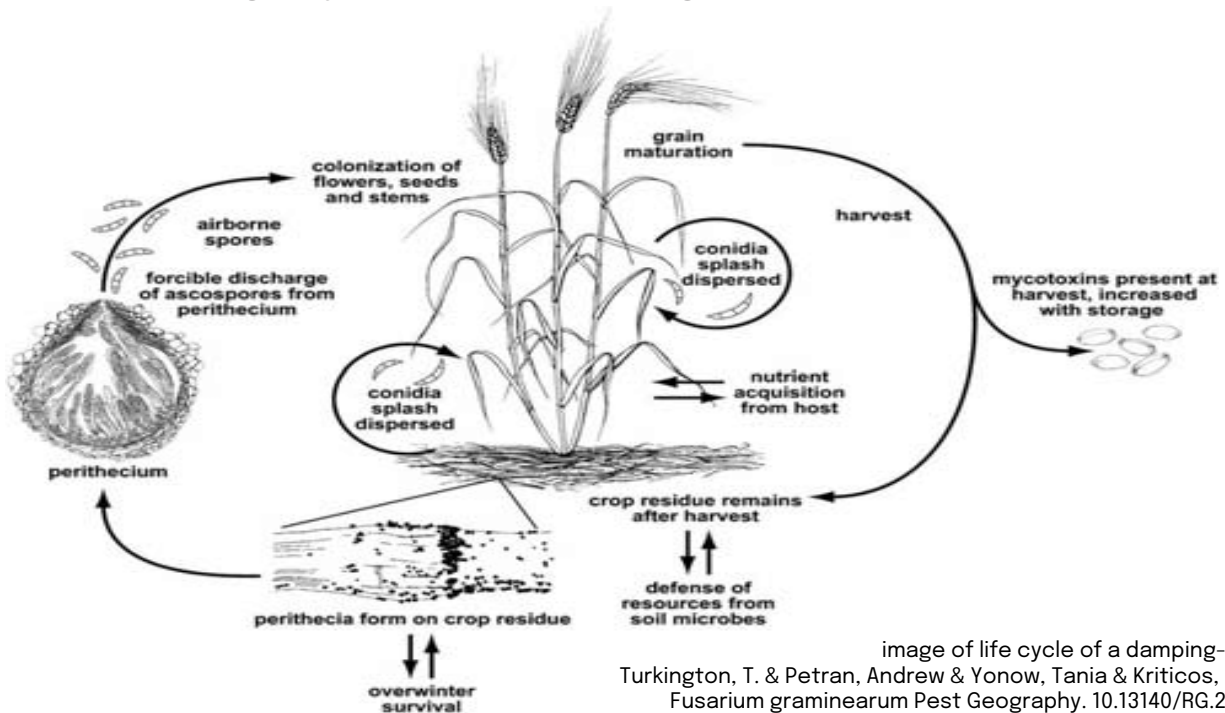


Healthy squash plants in the back, and squash plants affected by damping-off in the foreground. Photo by VSU Extension

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What Causes Damping-Off?

- There are two groups of infectious disease agents that commonly cause damping-off:
- The most common types are water molds, like Pythium and Phytophthora.
 - The next pathogen types are soilborne fungi, such as Fusarium and Rhizoctonia.



However, the presence of a soilborne fungus or a water mold is not enough to cause damping-off by itself. These pathogens need the right conditions:



Moist-To-Wet Soils



Cool-To-Moderate Air & Soil Temperatures



Planting The Same Crop In The Same Space For 1+ Years



Excess Nitrogen From Fertilizers

The pathogen can spread easily in contaminated soil, water, or infected plants. Certain pathogens can overwinter in soils, causing damping-off problems the next year if that contaminated soil is used again.

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How To Identify Damping-Off?



Bare spots in seedling tray where seedlings failed to germinate. Image by Mary Ann Hansen, Virginia Polytechnic Institute and State University, Bugwood.org.

When damping-off occurs preemergence: the seeds will fail to germinate. They will become soft, mushy, and rotten. If damping-off occurs postemergence, there are few symptoms to look for, depending on the pathogen that caused it.



Seedlings with lesions. Photo by Matt Montgomery, Sangamon-Menard Extension.

As the basal part of the seedling continues to soften, the next symptom will appear: reddish-brown lesions on the stem at the soil line.



Tomato plant seedlings displaying discolored stems at the soil line. Image by Craig Mauney, NC State Extension Program.

First, you can look closely at the base of stems or crown area of your seedlings. At or below the infection point or soil line, the stem will be visibly water-soaked and discolored.



Fallen over seedling is affected by damping-off seedling disease and over-watering. Photo by VSU Extension.

The other symptom is a wiry stem, as the seedling thins. At this point, it will likely fall over, wilt, and then die. The seedlings appear droopy once pathogens infect the vascular tissues (veins and arteries of the plant).

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How To Prevent Damping-Off

1 ENSURE YOUR SOIL CAN PROPERLY DRAIN, AND DO NOT OVERWATER.

If growing seedlings in containers, make sure they're elevated and have holes at the bottom to allow moisture to drain.

If using plant or grow bags, the fabric must be porous enough to drain excess water. Raised beds, or mulching can improve drainage.



"Tomato seedlings growing in elevated containers with holes ensure proper drainage." Photo by VSU Extension.

2 WAIT FOR SOIL TEMPERATURE TO WARM BEFORE PLANTING

The exact right time to plant varies based on your hardiness zone. Check your zone using USDA's Plant Hardiness Zone Map. Virginia is between zones 5a and 8a.

Our helpful planting guide has recommendations for specific plants week by week for each zone in Virginia.

You can help control your soil temperatures using seedbed heaters, for commercial or large-scale growers, or by using row covers or low tunnels that retain heat and create a warmer microclimate for your seedlings.



Example of proper mulching. Photo by VSU Extension

3 START CLEAN & STAY CLEAN

Get your seeds from a reliable source, and plant them in clean, uncontaminated soil.

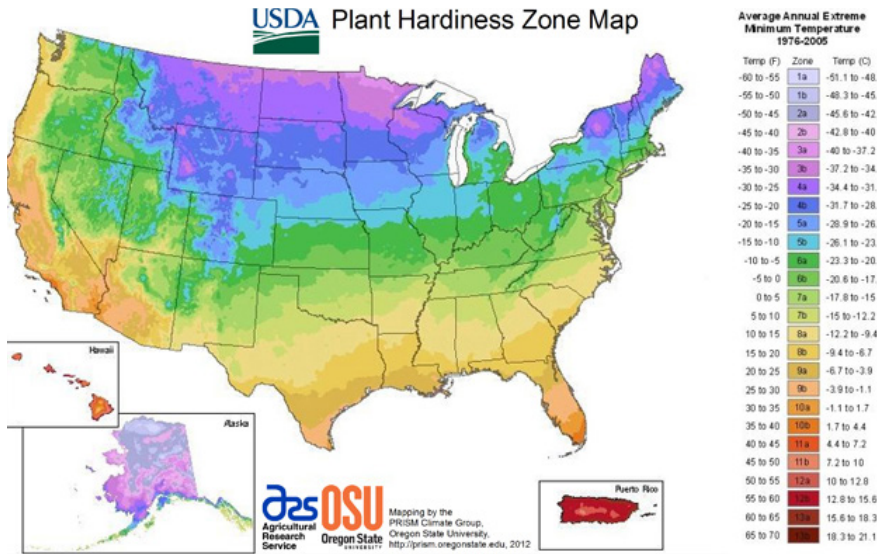
Before the planting season, disinfect your tools, containers, and worksites.

You may want to purchase seeds treated with conventional fungicides or organic biofungicides. Follow all safety precautions on the package label when using treated seeds.



Simple raised structures for seedlings provide warmth while the ground is too cold to plant. Photo by VSU Extension.

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Multi-species cover crop in the off-season. Photo by VSU Extension.

USDA's Plant Hardiness Zone Map.

4

ROTATE YOUR CROPS



One of many benefits of crop rotation is damping-off prevention. The harmful fungus in the soil searches for a familiar host when it germinates. When we plant different crops season to season, the fungus won't find the same crop as before and will wither away.

You can select cover crops that chemically combat harmful pathogens and weed seeds. This process, called allelopathy, is a powerful natural tool in your management toolbox.

5

USE SUN POWER



The sun's radiation and heat, also known as solarization, can kill soil pathogens. Cover moist soil with a clear plastic bag and expose it to full sunlight for four-to-six weeks. While this amount of sustained sunlight is never guaranteed in Virginia, this practical remedy could potentially salvage your crop investments in the case of severe soil contaminations.

6

UTILIZE BIO-PRODUCTS & MICROBES



You can find biologically based products that can improve germination or help seedlings grow faster. These contain, for example, the beneficial fungus *Trichoderma*. Encouraging these microbes to thrive in your soil will help stave-off damping-off diseases.

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