



# Pre- and Post-Emergence Damping -Off of Seedlings

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Diseases of seedlings can be divided into two types depending on the stage in which they attack the seedling: pre-emergence and post-emergence damping-off.

Pre-emergence damping-off occurs prior to, or just after the seed germinates. The most obvious symptoms associated with pre-emergence damping-off is a lack of seedlings breaking through the surface of the growing media. In this situation there are many bare spots associated with the plug flat or seedling tray ([Figure 1](#)) ([Figure 2](#)) ([Figure 3](#)). Due to the seeds being attacked prior to, or immediately after germination the seeds literally rot before they can break the media surface.

The pathogen that is typically associated with pre-emergence damping-off is *Pythium sp.* This common greenhouse pathogen is found in most native soils and on the floors and soil areas of the greenhouse. The fungus may enter the seed container by splashing water, particularly if the germination flats are on the floor of the greenhouse. *Pythium* may also enter the flat through native soils brought in to supplement growing media. The fungus can attack both the seed and the seedling and is most active in cool wet conditions.

With post-emergence damping-off, the seeds germinate and break the surface of the media, and usually produce cotyledons before damping-off becomes a problem. The disease usually starts at the base (media level) and works its way up the young stem. As the disease progresses it will girdle the stem and affected plants will rapidly wilt and eventually collapse onto the growing media ([Figure 4](#)) ([Figure 5](#)) ([Figure 6](#)). In some cases the disease-causing fungus will continue to grow on the collapsed seedling and sometimes can become visible. If left unchecked and favorable conditions persist, the fungus will start to grow on top of the surface of the media and colonize new seedlings. This is sometimes referred to as web blight because of the "web-like" appearance of the growth. Post-emergence damping-off can be caused by *Pythium sp.*, *Rhizoctonia sp.*, and *Thielaviopsis sp.* All three of these fungi are common pathogens that can be found in most greenhouses that grow bedding plants, etc. Disease development for all three of these pathogens is pretty much the same and in the early stages it may be difficult to distinguish from one another. It is important that the pathogens be properly identified since control measures will differ.

Regardless of whether it is pre- or post-emergence damping-off the end result is the same, a poor seedling stand ([Figure 7](#)), and if the problem is not corrected with the use of fungicide applications, eventually the entire crop will be lost.

The best way to control damping off is to keep it from becoming established. There are six easy steps to damping-off management.

1. Use a well-drained growing medium especially suited for seedling production. If you use a heavy medium that is not well-drained chances are you will have a damping-off problem.
2. Germinate seeds and grow seedlings at the proper temperature. This varies from crop to crop. This is really important in the case of *Pythium sp.* which is favored by cool temperatures.
3. Avoid fertilizer toxicity. This could cause damage to the roots and hence encourage disease development.

**Remember, seedlings are very fragile and their roots can be damaged very easily.**

- 4. Avoid plant stress. The more stressed the seedlings are the more likely they will succumb to disease. Make sure that things like soluble salts and media pH are in order.**
- 5. Apply strict sanitation techniques. A clean greenhouse is a disease-free greenhouse.**
- 6. And finally, if all else fails apply a fungicide. Fungicide application should be the last line of defense and not the first.**

**If you follow the six steps just covered it is very likely that pre- and post-emergence damping-off will not be a problem.**

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**Figure 1. Pre-emergence damping-off of coleous seedlings.**



**Figure 2. Pre-emergence damping-off of Dusty Miller (slide courtesy of G. Moorman).**



**Figure 3. Pre-emergence damping-off of Purselane.**





**Figure 4. Post-emergence damping-off of Vinca.**

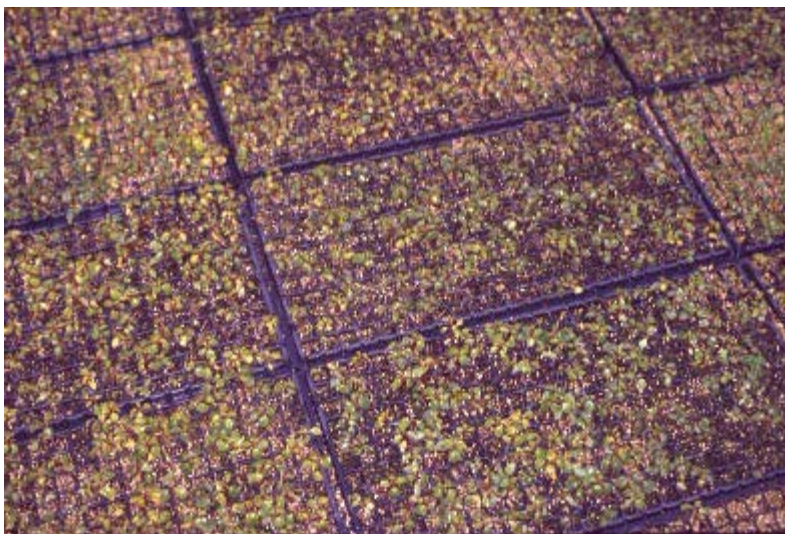


**Figure 5. Post-emergence damping-off of Begonia (slide courtesy of M. Daughtrey).**



**Figure 6. Post-emergence damping-off of Impatiens (slide courtesy of M. Daughtrey).**





**Figure 7. A poor stand. This is the end result of both pre- and post- emergence damping-off .**