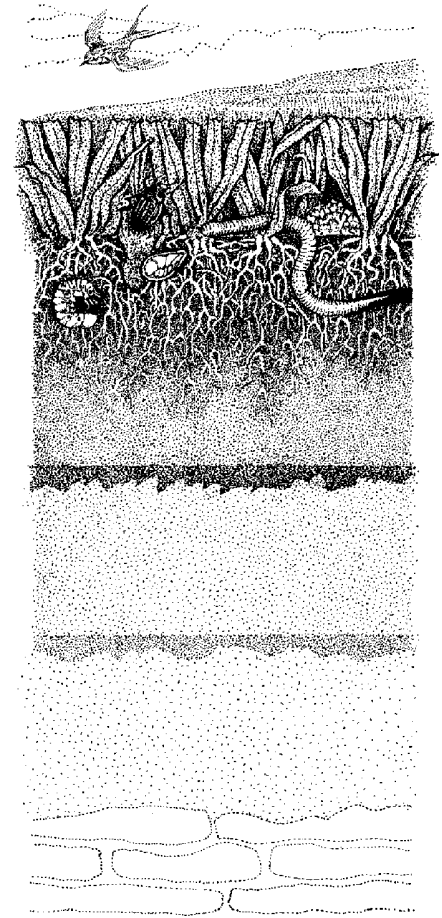


# CUTT

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## Understanding Seed Treatments for Turfgrass Establishment

**S**eedling establishment is the most critical stage in new turfgrass installations or renovations. Establishment efficiency can be affected by many different factors including speed of germination, inherent competitiveness with other turfgrass varieties as well as grass and broadleaf weed species, and susceptibility to seed rotting and damping-off pathogens. These pathogens are perhaps the most troublesome yet one of the most infrequently recognized cause of establishment failures. To understand ways of improving stand establishment, it is important to understand the nature and control of seed rotting and seedling pathogens of turfgrasses. ■

### Seed and Seedling Pathogens of Turfgrasses

As mentioned previously, many times the major limiting factors to stand establishment are seed rotting and damping-off fungi. The more common seed and seedling rotting fungal pathogens include species of *Pythium*, *Fusarium*, and *Rhizoctonia*, along with a myriad of other minor species comprising over 15 fungal genera. Few studies have focused on the ecology, epidemiology, and control of *Fusarium*- and *Rhizoctonia*-incited damping-off diseases of turfgrasses. However, turfgrass seedling diseases caused by *Pythium* species have been widely studied and this group of turfgrass pathogens are perhaps the most important in limiting stand establishment.

Not only are *Pythium* species major seed rotting and seedling rotting pathogens, but, once established in a turfgrass planting, become ma-

ior root rotting pathogens as well. In a survey of pathogenic *Pythium* species recovered from mature bentgrass turf, the more aggressive creeping bentgrass damping-off pathogens included *P. graminicola*, *P. aphanidermatum*, *P. aristosporum*, *P. vanterpoolii*, *P. myriotylum*, *P. tardicrescens*, and *P. volutum*. All of the highly aggressive isolates were more virulent to creeping bentgrass seedlings at warm temperatures (28°-32° C) than at cooler temperatures (16° C).

In another study of *Pythium* species on creeping bentgrass and perennial ryegrass, *Pythium graminicola* was isolated most frequently from mature stands of turfgrasses and nearly all isolates tested were highly virulent as seed rotting pathogens of creeping bentgrass and perennial ryegrass. Additional pathogenic species recovered were isolates of *P. aphanidermatum*, *P.*

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