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Plant Diseases

Root Rots and Seedling Disease of Beans and Peas

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Root rots, seed rots and damping off (death of seedlings before or after emergence) are major diseases of snap beans, lima beans and Southern peas. Seed rots and damping off are collectively referred to as seedling disease. These diseases cause poor stands and reduced plant growth and yield. The fungi that cause seedling disease and root rots can be found in most soils, but the occurrence of these diseases is unpredictable. When conditions are favorable for vigorous plant growth, root rot fungi do little damage. These fungi can survive in the soil for long periods and can be moved with the soil from place to place. They are rarely carried on the seed.

The fungi that can cause root rots and seedling disease are *Rhizoctonia solani*, *Fusarium solani* f. sp. *phaseoli* and several *Pythium* species. These fungi often occur together and are difficult to distinguish visually. Since the control methods differ, you should obtain assistance in identifying the disease from your local UT Extension office.

Rhizoctonia

Rhizoctonia can cause plant diseases over a broad range of soil temperatures, soil pH, soil



types, fertility levels and soil moisture levels. This fungus attacks plants at almost any age, causing seed rot; damping off of seedlings; or stunting, yellowing and death of older plants. Elongate, sunken reddish-brown lesions develop on roots and stems at or below the soil line (see photo). These lesions can girdle the stem, resulting in the death of the plant. Older plants may show little indication of the disease, although yields may be reduced. The pith may turn brick-red if invaded by the fungus.



Control

1. Use only high-quality seed, treated with captan, chloroneb or thiram. An unnatural pink, green or gray color of purchased seed indicates it has been treated. If seed has not been treated, apply a fungicide to them according to label directions.
2. If the field has a history of *Rhizoctonia* seedling disease and root rot, apply the fungicide Quadris®, Terraclor® or Ridomil Gold PC 11G® to the furrow and covering soil at planting. Refer to the label for further instructions.
3. Plant seeds no more than 1 inch deep, as deep planting encourages *Rhizoctonia* infection.
4. Plant in warm soil to allow rapid germination.
5. Because *Rhizoctonia* is parasitic on many crop plants, crop rotation is of little value. However, a four- or five-year rotation may be of some benefit.
6. Control soil insects and nematodes. These organisms weaken the plant, predisposing it to infection.

Fusarium

Fusarium root rot and seedling disease are favored by warm soils and may be more of a problem later in the season. This disease is most common when the weather is hot, and in acid, poorly fertilized soils. Fusarium root rot tends to be evenly distributed through large portions of a field.

Plants infected with *Fusarium* are stunted and unthrifty. Seedlings may die within a week of emergence. Red lesions develop on the roots of older plants. These lesions may coalesce, turn dark brown and develop lengthwise cracks. The infected root remains firm and does not become soft; consequently, this disease is often called “dry root rot.” The tap root tip and lateral roots shrivel and die. If the plant does not die immediately, rootlets may develop above the dead area, which will allow the plant to survive. Aboveground symptoms of this disease include stunting, wilting and the presence of few, poorly filled pods.

Control

1. Because continuous bean culture may result in an increase of the fungus, long-term rotations (four or five years) with nonleguminous crops will reduce the severity of the disease.
2. Fungicide seed treatments are somewhat helpful in reducing the severity of the seedling disease phase of fusarium root rot.

3. Do not cultivate deeply, as this will damage roots and increase disease severity.
4. Nematodes can increase root rot severity. Control nematodes by crop rotation or other means. Refer to UT Extension factsheets SP277-T, *Managing Nematodes in Commercial Vegetables*, or SP341-L, *Nematode Control in the Home Garden*, for nematode control practices.
5. Subsoiling to break up hardpans and planting on raised rows will improve drainage and help to control the disease.
6. Apply lime and fertilizer according to soil test recommendations.

Pythium

Several species of *Pythium* attack beans and Southern peas, causing damping off and stem rot. Some *Pythium* species are favored by cool temperatures, whereas others are favored by warm temperatures. All are favored by wet conditions. *Pythium* causes a wet rot of the seedling, either before or after emergence. In some cases, the pith of the stem is invaded, causing “hollow stem.” The fungus may invade the stem at or below ground level and spread up and down, producing a soft and colorless to dark brown rot. Larger plants may also wilt or die. A cottony growth can often be seen on infected stems during periods of high humidity.

Control

1. Do not plant low-lying, wet-natured fields. Plant on raised rows to improve drainage.
2. If the field has a history of *Pythium* damping off, commercial growers should treat the seed with Apron 25W®, in combination with a registered broad-spectrum fungicide. Ridomil Gold EC® and Ridomil PC 11G® are soil-applied fungicides that are effective against *Pythium*.
3. Plant under conditions favorable for rapid emergence of the crop. A well-prepared seedbed, warm soil and proper planting depth will help avoid problems with seedling disease.

Disclaimer

This publication contains pesticide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. The label always takes precedence over the recommendations found in this publication.

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