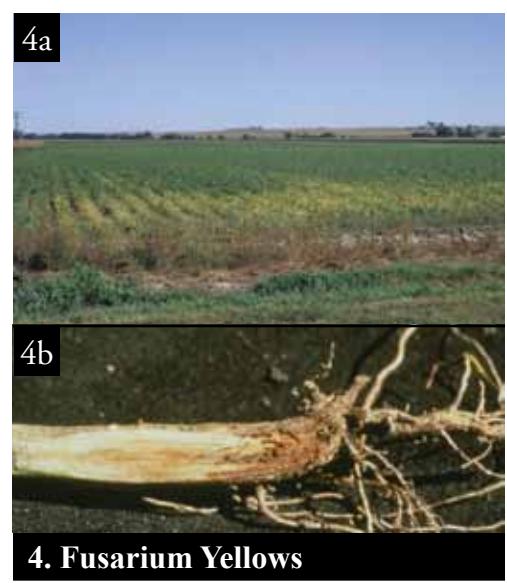
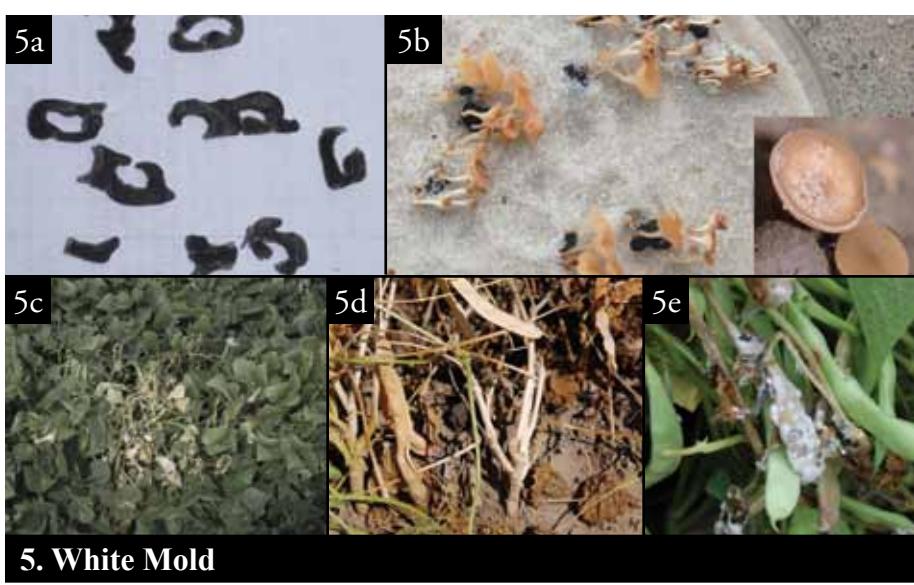
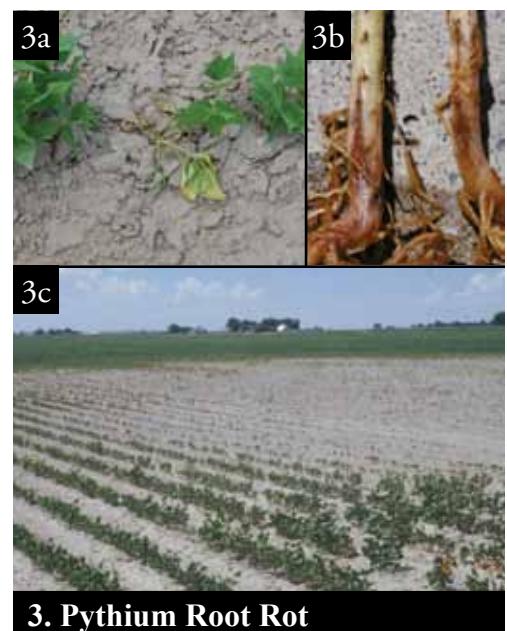
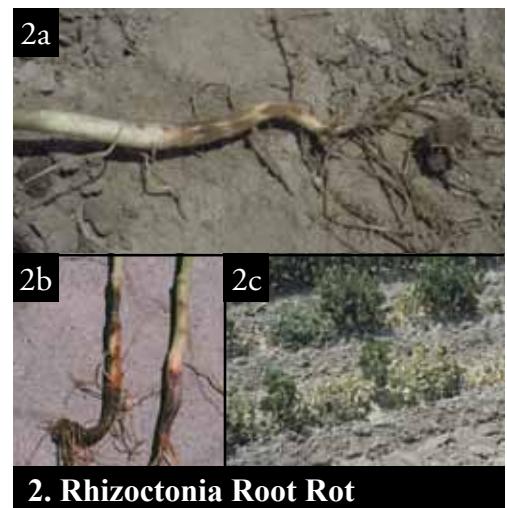
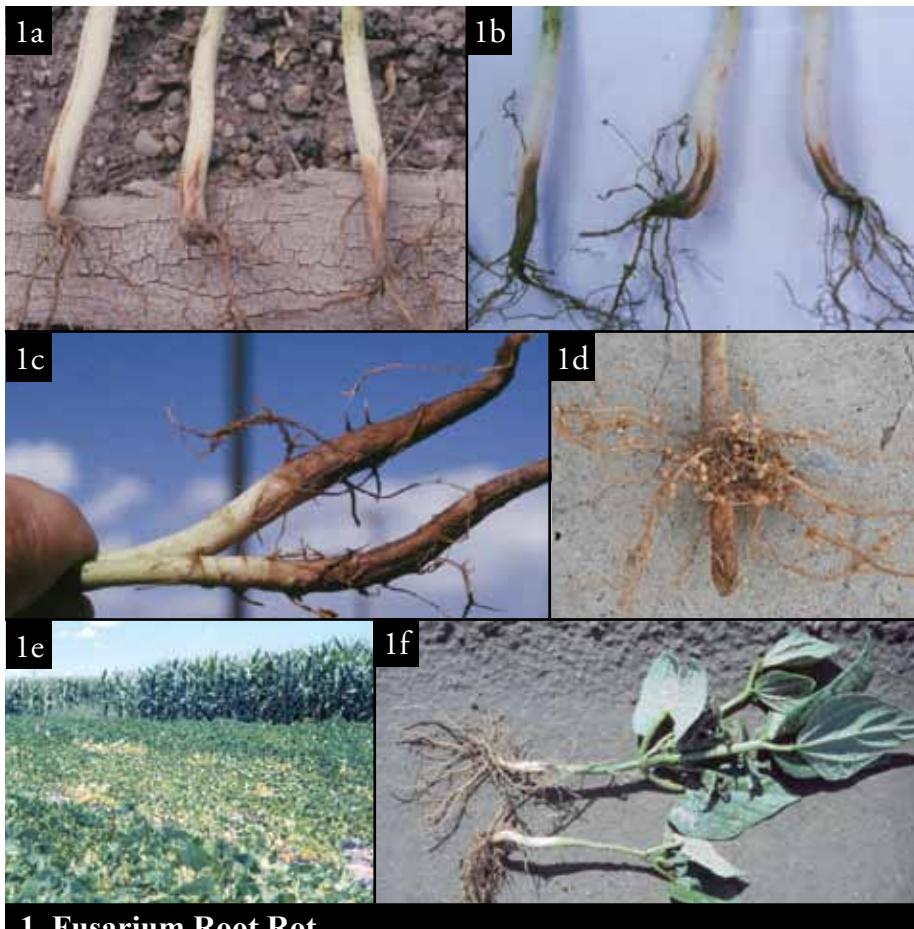


Dry Bean Disease Profiles II

UNL Extension Plant Pathology Team

Robert M. Harveson, Loren J. Giesler, Tamra A. Jackson,
Stephen N. Wegulo, Amy D. Timmerman



Diseases	Symptoms*
1. Fusarium Root Rot <i>Fusarium solani</i> f. sp. <i>phaseoli</i>	Initial symptoms appear as reddish, longitudinal streaks on hypocotyls and taproots (<i>Figure 1a</i>). Affected areas may merge and enlarge with age, turn necrotic (<i>Figure 1b</i>), and gradually extend up the stem (<i>Figure 1c</i>). Plants are seldom killed and often compensate for severe infection by producing numerous adventitious roots above the rotted taproots (<i>Figure 1d</i>). Foliar symptoms often involve yellowing and stunting (<i>Figure 1e</i>). Stresses such as dry conditions and soil compaction combined with disease also limit root growth and result in severely stunted plants (<i>Figure 1f</i>).
2. Rhizoctonia Root Rot <i>Rhizoctonia solani</i>	Disease begins as small circular or linear sunken lesions with a reddish-brown border (<i>Figure 2a</i>). Cankers enlarge with age and may retard normal plant growth by girdling hypocotyls (<i>Figure 2b</i>). If the root system is sufficiently destroyed, foliage completely collapses and plants never recover and die (<i>Figure 2c</i>).
3. Pythium Root Rot <i>Pythium</i> spp.	<i>Pythium</i> spp. can cause both pre- and postemergence damping off. Infected seedlings that do emerge may wilt and die within several weeks (<i>Figure 3a</i>). Roots and hypocotyls may show lesions that are initially water-soaked and may continue to progress up stems several inches above the soil line (<i>Figure 3b</i>). This results in poorly functioning, necrotic root systems in the surviving plants. Disease incidence is often greater in lower areas of fields where water tends to accumulate (<i>Figure 3c</i>).
4. Fusarium Yellows <i>Fusarium oxysporum</i> f. sp. <i>phaseoli</i>	Foliar symptoms first appear as yellowing and wilting of older leaves (<i>Figure 4a</i>), followed by younger leaves if the disease progresses. Severely affected plants may wilt permanently. Factors favoring wilt are the same as those for Fusarium root rot, including high temperature stress and soil compaction. Vascular discoloration of root tissues is the primary diagnostic symptom (<i>Figure 4b</i>). It varies in intensity depending on cultivar and environmental conditions.
5. White Mold <i>Sclerotinia sclerotiorum</i>	The pathogen survives as hard, black sclerotia in soils or infected plant residue (<i>Figure 5a</i>). The sclerotia germinate in soils to form mushroom-like apothecia (<i>Figure 5b</i>). These structures release spores, initiating infection. Infection is first seen as small water-soaked spots on stems, pods, or leaves. The spots enlarge to become a rotted, watery mass of tissue covered with white, moldy fungal growth. Affected plants wilt and entire branches or plants may be killed (<i>Figure 5c</i>). Dead, infected plants dry out and are bleached white (<i>Figure 5d</i>), which contrasts to the normal light tan color of mature bean plants. Masses of white mycelium develop into the sclerotia (<i>Figure 5e</i>) and serve as an overwintering mechanism to initiate new infections in later years.

*Root rot diseases are difficult to correctly identify by symptoms exclusively and often need complete confirmation by laboratory tests.

Photo Credits: Figure 4b courtesy of H.F. Schwartz, Extension Specialist in Plant Pathology at Colorado State University. All other photos courtesy of faculty in the University of Nebraska–Lincoln Institute of Agriculture and Natural Resources.