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Soybean Disease Profiles II: Stem and Root Rot Diseases

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Authors

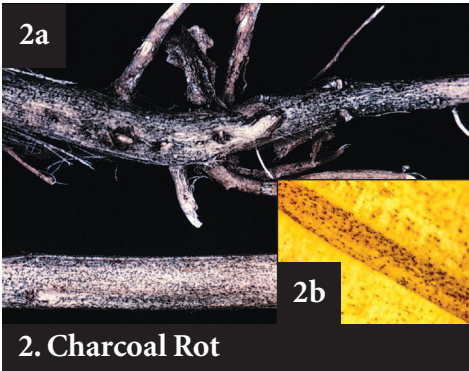
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Soybean Disease Profiles II

Stem and Root Rot Diseases

UNL Extension Plant Pathology Team

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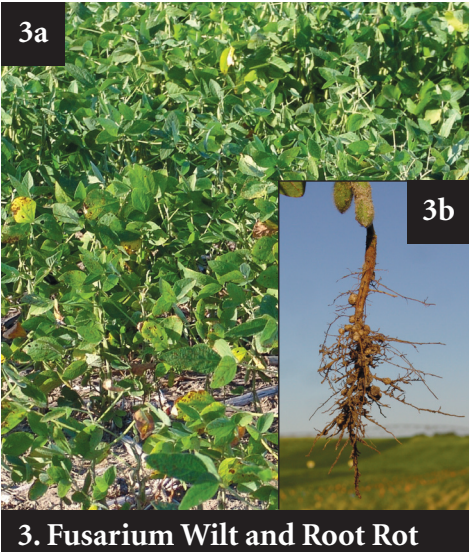


2. Charcoal Rot

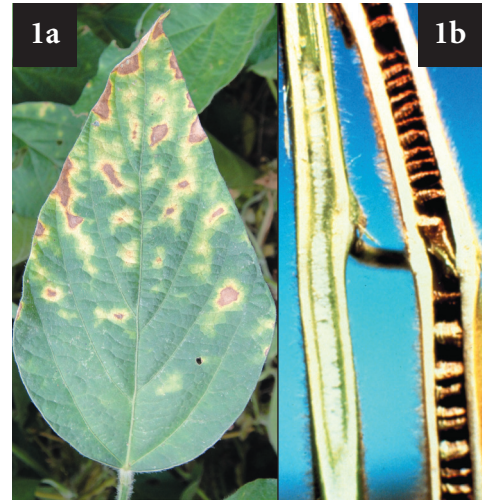


5. Pod and Stem Blight

6. Phomopsis Seed Decay



3. Fusarium Wilt and Root Rot



1. Brown Stem Rot



9. Seedling Blight

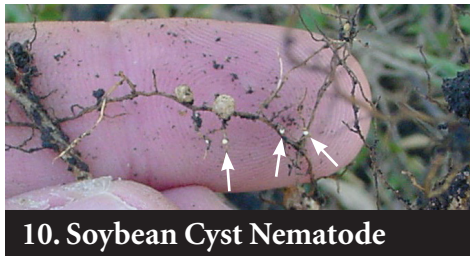


4. Phytophthora Root and Stem Rot

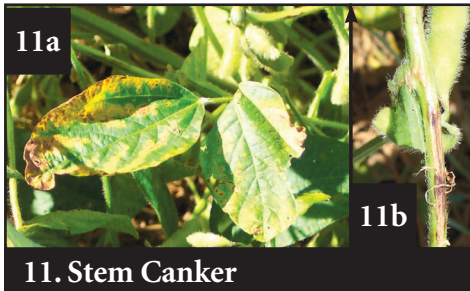


7. Rhizoctonia Root Rot

8. Sclerotinia Stem Rot



10. Soybean Cyst Nematode



11. Stem Canker



12. Sudden Death Syndrome

Disease	Description
1. Brown Stem Rot (BSR) <i>Phialophora gregata</i> *Management: C, N, R	Leaves brown and attached to petiole; interveinal brown to yellow discoloration in leaves; center of stems brown, extending up from roots (<i>Figure 1b</i>).
2. Charcoal Rot <i>Macrophomina phaseolina</i> Management: C, N, R	Leaves of infected plants yellow, wilt, and stay attached; red-brown discoloration of taproot vascular tissue extending up the stem; small black bodies (sclerotia) (<i>Figure 2b</i>) under the stem epidermis give it a gray-black color.
3. Fusarium Wilt and Root Rot <i>Fusarium</i> spp. Management: C, N, R	Leaves of infected plants yellow and wilt under dry conditions; mid to lower canopy leaves yellow and defoliate; brown vascular tissue in roots and stem under epidermal layers; no external stem discoloration or lesions; roots of seedlings will be reddish-brown to dark brown and often the tap root is rotted (<i>Figure 3b</i>).
4. Phytophthora Root and Stem Rot <i>Phytophthora sojae</i> Management: C, F, R	Seed decay and seedling root rots before or after emergence; seedlings wilt and die with discolored stem pith (<i>Figure 4b</i>); plants become yellowed, wilt and show a dark discoloration of the lower stem (<i>Figure 4c</i>); roots of older plants are rotted.
5. Pod and Stem Blight <i>Diaporthe phaseolorum</i> var <i>sojae</i> Management: C, F, R	Symptoms on plants nearing maturity are numerous, small black dots on lower stems, petioles, and pods; speck-sized fruiting structures usually arranged linearly.
6. Phomopsis Seed Decay <i>Phomopsis longicolla</i> Management: C, F, R	Infected seed shriveled, elongated, and cracked; seed appears white and chalky; poor germination if planted.
7. Rhizoctonia Root and Cortical Rot <i>Rhizoctonia solani</i> Management: F, N	Decay of lateral roots and localized brown to red-brown lesions on the hypocotyls and lower stem; discoloration limited to cortical layer.
8. Sclerotinia Stem Rot <i>Sclerotinia sclerotiorum</i> Management: C, F, N, R	During pod development leaves wilt and turn gray-green before turning brown and drying; white fungal growth on stems and pods; diseased stems are bleached; sclerotia on and inside stem and pods (<i>Figure 8b</i>).
9. Seedling Blights can be caused by <i>Pythium</i> spp., <i>Fusarium</i> spp., <i>Rhizoctonia solani</i> , and <i>Phytophthora sojae</i> Management: C, F, N, R	Seed decays before or after emergence; seedlings wilt and die; roots and lower portion of stems rotted; rot confined to outer root surface.
10. Soybean Cyst Nematode (SCN) <i>Heterodera glycines</i> Management: C, R	Heavily colonized plants may be stunted and chlorotic; root system reduced with poor nodulation; yellow to brown cysts visible on roots (pin-head size) (↖).
11. Stem Canker <i>Diaporthe phaseolorum</i> Management: C, F, R	Small, reddish-brown lesions near nodes after flowering; lesions expand longitudinally and develop into a sunken canker that does not encircle the stem (<i>Figure 11b</i>); foliar symptoms may develop similar to SDS and BSR.
12. Sudden Death Syndrome (SDS) <i>Fusarium solani</i> f. sp. <i>glycines</i> Management: C, N, R	Interveinal necrosis; spots coalesce to form brown streaks between the leaf veins with yellow margins (<i>Figure 12b</i>); leaf drop with petiole (leaf stem) remaining; deteriorated taproots and lateral roots; root cortex is light-gray to brown and may extend up the stem.

Photo Credits: Soybean cyst nematode, courtesy of G. Tylka, Iowa State University; all other photos courtesy of faculty in the UNL Institute of Agriculture and Natural Resources.

*Management strategies which can be effective: **C** — cultural practices, such as the use of crop rotation or tillage; **F** — seed treatment or foliar fungicides; **N** — management may not be necessary, practical, or possible; **R** — varieties vary in their resistance/susceptibility and resistance will reduce disease severity.