ROOT ROTS

Damage symptoms
Plants can become infected at any stage of growth. The first indication of a problem may be nutrient deficiency-like symptoms followed by growth reduction, wilt, and possibly plant death. Roots appear brown to black. Normal root growth is greatly reduced, thus the root ball will appear smaller than normal. Often roots infected with either *Pythium* or *Phytophthora* become so rotten that when you pull on them, the outer portions slip off, leaving the hardened root core.

Host plants
Most plants grown in the greenhouse are subject to root rot.

Disease characteristics
Root rots may be caused by noninfectious or infectious factors. Noninfectious factors include overwatering, excess use of fertilizer, drought, extremely high temperatures, salt buildup in potting media and toxic chemical buildup in soil. The infectious agents are soil-borne fungi or bacteria. Fungi include *Pythium*, *Rhizoctonia*, *Phytophthora*, *Thielaviopsis*, and *Fusarium*, which also cause other symptoms, i.e., damping-off and blights. The plant must be removed from the pot, and the agent viewed under magnification to positively identify the pathogen. All infectious root rot pathogens can exist in growing media. Most of these microbes are confined to soil and can only affect roots. Root rot pathogens kill the cells they invade. Host root exudates stimulate fungal spore germination and provide food for the pathogen. The spread of infection in the greenhouse is usually via soil particles or water.

Management
Prevention is the best management for root rot pathogens.

- √ Use soilless potting mixes and sterilize them before use.
- √ Treat soil with heat, steam, chemical drenching or fumigation before use.
- √ Make sure the sanitization process eliminates the pathogens; a few spores can flourish quickly in the relatively sterile medium.
- √ Clean tools, hoses, walkways and boots regularly.
- √ Apply preventative biological soil treatment at planting.
- √ Use chemical fungicides if necessary.
- √ Avoid high EC levels. EC is a measure of soil salinity. High EC levels may injure roots, making them susceptible to root rots.

Healthy poinsettia plant.

Poinsettias with symptoms of root rot.

A root system with pythium root rot. The outer cortex of the root will slough off, leaving the central stele of the root. (see arrow)