The Plant Doctor's LANDSCAPE TIPS

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RHIZOCTONIA ROOT AND STEM ROT

INTRODUCTION:

Rhizoctonia solani is a soil-borne fungus that can cause severe diseases on many plants. The host range of this species of fungus is very broad. Typically, R. solani affects many herbaceous crops in the agricultural arena, including ornamental annuals and perennials. Occasionally, the fungus is known to attack woody plants. Different subspecies of the fungus may exhibit a very broad host range or may prefer certain types of plants in lieu of others.

Plant production in nurseries and greenhouses may be plagued by R. solani-incited diseases because the fungus can be so difficult to manage. Strict sanitation, other cultural practices and diligent use of chemical fungicides help to minimize the effects of the fungus. Sometimes, however, the fungus may become active when fungicides "wear off," after plants are installed in landscapes. It is usually difficult to determine the source of Rhizoctonia infections since the fungus can be found throughout the Midwest as a natural soil inhabitant.

SYMPTOMS AND DISEASE CYCLE:

Rhizoctonia typically induces stem cankers and root rots on plants (Photos 1, 2 & 3). With root rots and stem cankers, above-ground portions of the plants may exhibit a variety of symptoms including wilt, death, chlorosis (yellowing) from lack of nutrient and water uptake, and poor growth. Rhizoctonia is also involved in a complex of diseases known as "damping off." Damping off involves the infection of germinating seeds and seedlings, resulting in their death (Photo 4 and inset). Damping off is a major concern in greenhouse and nursery production. Rhizoctonia may also infect cuttings, thereby reducing or inhibiting rooting; plants often die from infections.

As a soil inhabitant, Rhizoctonia has evolved to survive very well in natural soil conditions. It may survive in the soil for long periods of time by colonizing and degrading organic matter; hence, in its saprophytic state, it is quite different from those pathogens (disease agents) that require a living host plant. When the opportunity presents itself, such as when it comes in contact with a plant, it may initiate an infection that often results in the death of the plant by causing a root rot or stem lesion. In some instances, especially very damp conditions, the fungus may advance aerially by colonizing dense foliage. The fungus may survive in plant refuse as hyphae (fungus body; see Photo 5) or as highly resistant overwintering structures known as sclerotia.

RHIZOCTONIA ROOT AND STEM ROT MANAGEMENT:

Similar to other soil-borne pathogens, Rhizoctonia can be very difficult to manage. In nurseries and greenhouses, use pathogen-free soil as a growing medium. Implement strict sanitation practices, to avoid introducing the fungus into growing media. Avoid extremes in cultural practices such as excesses or deficiencies of water and nutrients. Excess fertilizer salts may injure plant roots and stems, predisposing plants to infection by Rhizoctonia. Occasional drenches of fungicides may help to inhibit the activity of the fungus.

An important criterion for landscapers is to purchase disease-free plants. Avoid any plants that exhibit unhealthy roots, stem lesions or unthrifty growth. As with production, avoid extremes of cultural practices that may predispose plants to infections. Any plants showing signs of infection should be immediately removed and destroyed before the fungus can spread to adjacent plants. Maintain healthy soil biology by promoting microbial activity with mulches and organic amendments. Intense microbial activity tends to fend off Rhizoctonia due to competition and the production of natural fungicides. Rotation of landscape annuals and perennials may be wise where severe Rhizoctonia infestations have been confirmed. Soil removal, fungicide applications and other aggressive procedures may be advised in some situations.

For more information, please feel free to email me at robertsd@msu.edu or contact a professional plant health-care provider. The author, MSU or MGIA do not endorse any particular products. If using pesticides, be sure to read and follow label directions.

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Photo 1. This Chrysanthemum exhibits the typical stem canker caused by Rhizoctonia solani.

Photo 2. The lily on the right exhibits typical root rot symptoms as evidenced by darkened roots and yellow foliage. It may be very difficult to diagnose the cause of the root rot: excess water, excess fertilizer salt, a Rhizoctonia infection or other soil-borne pathogen. A lab culture may be necessary.

Photo 3. Rhizoctonia exhibits a very broad host range, infecting many herbaceous plants used in the landscape. In this particular case, Vinca is infected by Rhizoctonia.

Photo 4. Along with other pathogens, Rhizoctonia is implicated as a frequent cause of damping off: the infection and death of seedlings. In these situations, the fungus may attack the stems first (inset), but eventually colonizes the entire flat of seedlings.

Photo 5: Rhizoctonia diseases may need to be cultured in a lab for confirmation. In this close-up photo of a laboratory culture of Rhizoctonia, individual hyphae, analogous to tubes or roots, may be seen. These hyphae grow through soil to attack and colonize plant tissue.