Rhizoctonia Seedling Blights of Vegetables and Field Crops

Tom Kucharek, Professor, Extension Plant Pathologist, Plant Pathology Dept.
1978, Revised Nov. 2000

Florida Cooperative Extension Service / Institute of Food and Agricultural Sciences / University of Florida / Christine Waddill, Dean

Introduction

Rhizoctonia spp. are soil inhabiting fungi that commonly infect numerous plant species. Beans (vegetable types and soybeans) and peas (english, southern, blackeyed, etc.) are commonly infected by *Rhizoctonia* spp., but seedlings of many other plant species are also susceptible to these fungi. Infection of seedlings results in a disease called seedling blight. If infection occurs prior to the emergence of the seedling , the resulting disease is called preemergence seedling blight and it is often lethal. Preemergence seedling blight may occur as a result of infection by *Rhizoctonia* spp. alone or in combination with Py*thium* spp., another group of soilborne fungi (Figure 2). *Rhizoctonia* spp. may infect a seedling prior to emergence or after emergence and cause various kinds of stem lesions (Figures 1, 3, 4). Usually, infections of stems occur near the soil surface and result in some shade of brown, red or orange discoloration. Older lesions will appear sunken with less red color and may eventually rot the entire outer portion of the stem, thus causing the plant to fall over.

Rhizoctonia spp. are capable of causing plant diseases over a broad range of soil temperatures, soil pH, soil types, fertilizer levels, and soil moistures. The versatile nature of *Rhizoctonia* spp. results from their broad genetic potential. Individual isolates of *Rhizoctonia* spp. can cause plant disease in numerous plant species and under varied environmental conditions. Further, the number of "strains" that exist can increase with each new scientist added to the roster and the time spent on strain identification..

Control

Control of seedling blight caused by *Rhizoctonia* spp. is achieved on commercial crops, such as tomatoes, peppers, strawberries, celery transplant beds and tobacco transplant beds, by preplant fumigation with methyl bromide + chloropicrin or liquid fumigants such as Vapam. Even though soil fumigation is highly effective against *Rhizoctonia* spp., recontamination of fumigated areas should be avoided. Any method that reduces movement of soil from nonfumigated areas into fumigated areas will achieve this goal. For example, minimize stepping in fumigated areas from nonfumigated areas. Avoid soil wash due to rain or irrigation from nonfumigated to fumigated areas by slightly elevating the fumigated area.

Control of Rhizoctonia-induced diseases in situations not mentioned above is more difficult and erratic. Because of the versatility of *Rhizoctonia* spp., we must utilize several control measures, often in a sequence, to attain maximum control if soil fumigation is not used. The following control measures *used collectively* will reduce seedling blights caused by *Rhizoctonia* and other fungi. **The major objective with this group of control measures is control on seedlings and stems of young plants by establishing a fast growing seedling which essentially reduces the "hazard time" as young tender plants are more susceptible than older plants.**

1) Use only healthy *disease-free seed, seed pieces* or *transplants*. Although *Rhizoctonia* is not notorious for being seed-transmitted, poor quality seed will germinate slowly, if at all, which offers a distinct advantage to *Rhizoctonia* spp. *2) Avoid deep seeding,* if moisture permits, as deep planting is advantageous for infection. Likewise, deep setting of transplants should be avoided. 3) Especially in fields where fumigation was not used, *plant when the soil temperature is suitable for rapid*

germination. Okra, for example, is a warm season plant which germinates slowly during March in the Gainesville area, whereas a June planting will be conducive for rapid germination thereby minimizing the "hazard period" for infection. 4) *Seed should be treated with a fungicide* for protection against infection from *Rhizoctonia* spp. in the soil. Seed treatment fungicides such as captan and thiram are nonsystemic in the plant, but they are labelled for use on numerous plant species. Chloroneb (Demosan) is an effective systemic seed treatment fungicide which offers further protection of stems or young emerged seedlings. It is labelled for use on beans, southern peas, soybeans, and cotton. 5) *Use crop rotation.* 6) Prepare land so that a *minimum amount of old plant debris is on the soil surface in the seeding zone.* Where minimum tillage is used, a debris-free strip should be available in the zone used for seeding. 7) When double cropping, after bottom plowing the old crop, *allow green matter to decompose for 30 days.* Undecomposed green matter has been a major source of *inoculum* of *Rhizoctonia* spp. on green beans and soybeans in Florida. 8) *Control soil insects and nematodes.* These organisms weaken the plant, thereby predisposing the plant to infection. 9) Avoid high seeding rates and close transplanting as *Rhizoctonia* spp. can grow from an infected plant to adjacent healthy plants. 10) When cultivating, avoid moving the soil onto stems.

Figure 2. Preemergence seedling blight on soybeans.

Figure 3. Rhizoctonia seedling blight on watermelon.

Figure 1. Rhizoctonia seedling blight on soybean.

Figure 4. Rhizoctonia seedling blight on green beans.