Potato XXII

Early Dying

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Identification and Life Cycle

Early dying is a disease of potato caused by an interaction of soilborne fungi (Verticillium dahliae or V. albo-atrum) and various species of root-lesion nematodes (Pratylenchus spp.). Disease can be caused by Verticillium spp. alone when pathogen populations are high. Verticillium spp. that cause early dying have broad host ranges, but only certain strains are thought to cause disease on potato. The fungus infects roots and invades the vascular system, moving with water up the stem, and eventually invades the apical tissue. V. dahliae produces black, resting structures called microsclerotia that are capable of surviving in soil at least 10 years in the absence of a host. The pathogen survives between potato crops as microsclerotia or melanized hyphae and pathogenically on alternate hosts. The pathogen can be introduced into fields on contaminated seed pieces, in infested soil on equipment, and as windblown conidia.

Plant Response and Damage

Early blight symptoms initially appear as leaf yellowing, curling, and necrosis on one side of petioles. Younger leaves are generally the first to display symptoms, but as disease continues to develop symptoms progress up the plant. A slight brown discoloration of vascular tissues is apparent when stems are cut in cross-section, and may result in stem-end tuber discoloration in severe cases. The disease may reduce yield as much as 40%, and also may affect tuber specific gravity. Low populations of Verticillium spp. can be very damaging to potato when small populations of root-lesion nematodes also are present.

Management Approaches

Biological Control

Incorporation of green manure crops such as sudangrass the season before potatoes are planted can reduce early dying severity.

Cultural Control

Plant varieties resistant or tolerant to early dying, such as ‘Ranger Russet’, ‘Chiptea’, and ‘Gemchip’. Provide adequate but not excessive nitrogen, phosphorous, and potassium fertilization for optimal yields. Avoid excessive irrigation early in the season and deficient irrigation after flowering. Early dying tends to be more severe under furrow

than sprinkler irrigation. Long crop rotations (greater than 5 years) to non-hosts may provide some disease control.

Chemical Control

Soil fumigation suppresses disease, but may not be cost effective or available in all potato production regions. Verticillium spp. populations quickly increase when followoing potato or other hosts crops are grown on fumigated soils. Nematicides may provide some disease suppression when root-lesion nematodes are present.

Common/Trade Name	Rate	Remarks
Metam Sodium		
Vapam	40 to 100 gal per acre	Some of the soil properties to consider when determining the application rate include soil texture, percent organic matter and depth of soil to be treated.
Nemasol 42%	30 to 75 gal per acre	Some of the soil properties to consider when determining the application rate include soil texture, percent organic matter and depth of soil to be treated.
Nemasol 426	30 to 75 gal per acre	Some of the soil properties to consider when determining the application rate include soil texture, percent organic matter and depth of soil to be treated.
1,3-Dichloropropene + Chloropicrin		
Telone C-17	10.8-30.0 gal per acre	

Categories: Potato, Disease, Early Dying

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