

## Dry Bean

### Root Lesion Nematode

Howard F. Schwartz, David H. Gent, Gary D. Franc and Robert M. Harveson

#### Identification and Life Cycle

Many nematode species are found in association with dry bean roots. Two species that cause significant yield reductions are the root-knot (*Meloidogyne spp.*) and lesion (*Pratylenchus spp.*) nematodes. These species and the chrysanthemum foliar nematode, *Aphelenchoides ritzemabosi*, recently reported on bean in Wyoming, are discussed below.

Root lesion nematodes reproduce most quickly and cause the most damage to dry bean in sandy soils. Damage is especially severe when soil moisture and nutrients are limiting. Their survival is best in cool, moist soils. Reproduction is highest at a soil pH of 5.2 to 6.4. The movement of infested soil on equipment, irrigation water, and the movement of infested plant material can disseminate nematodes within and among fields.

#### Plant Response and Damage

Root lesion nematode aboveground symptoms on plants with severe root infection may include chlorosis, stunting, and low vigor. Infected roots may be poorly developed and bear small, brown-black lesions. Small fibrous roots may be killed. Lesion nematodes are endoparasites, and their feeding and penetration activities may destroy epidermal and cortical cells. Root destruction is more severe in the presence of other soil-borne fungal pathogens which may mask the injury caused by lesion nematodes. Proof of lesion nematode infection requires extraction of nematodes from roots and associated soil, and identification of *Pratylenchus spp.*

#### Management Approaches

##### Biological Control

Incorporation of green manure crops such as oat, sudangrass, sesame, rapeseed, white mustard, or perennial ryegrass the season before dry beans are planted can reduce some nematode populations.

## Cultural Control

Control of lesion nematodes is based on practices that prevent populations from increasing to damaging levels. Crop rotation has limited effect because of the extensive host range of lesion nematodes. For example, very high populations are often found in roots of field corn. Many weed species support high populations of lesion nematodes and should be controlled throughout the crop rotation. There is limited information on availability of resistant varieties and resistance may vary significantly among the various species of lesion nematodes.

## Chemical Control

Chemical nematicides may be effective but are expensive and may not be justified unless yield losses are high. Nematicides used on a previous crop in the rotation, i.e., sugar beet or potato, may exhibit some beneficial carryover effects on the following bean crop.

### *Product List for Root Lesion Nematode:*

<b>Pesticide</b>	<b>Product per acre</b>	<b>Remarks</b>
<b>Nematicide/Insecticide</b>		
Mocap EC	2.0-2.9 fl oz/1000 ft banded	Restricted use; preplant incorporate 2 to 4" deep.
	1-1.33 gal broadcast	
Temik	7.5-15 oz/1000 ft banded	Restricted use; drill 2-3" below or to the side of seed; 90 day PHI
	7-14 lb broadcast	
<b>Fumigant</b>		
Telone II	9-15 gal	Restricted use; Preplant application, aerate 7-14 days.
Telone C-17	10-17 gal	Restricted use; Preplant application, aerate 7-14 days.
Vapam	40-100 gal	Restricted use; Preplant application, aerate 7 days.

*The information herein is supplied with the understanding that no discrimination is intended and that listing of commercial products, necessary to this guide, implies no endorsement by the authors or the Extension Services of Nebraska, Colorado, Wyoming or Montana. Criticism of products or equipment not listed is neither implied nor intended. Due to constantly changing labels, laws and regulations, the Extension Services can assume no liability for the suggested use of chemicals contained herein. Pesticides must be applied legally complying with all label directions and precautions on the pesticide container and any supplemental labeling and rules of state and federal pesticide regulatory agencies. State rules and regulations and special pesticide use allowances may vary from state to state: contact your State Department of Agriculture for the rules, regulations and allowances applicable in your state and locality.*

Categories: Dry Bean, Disease, Root Lesion Nematode

Date: 04/01/2007