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Diseases Caused by Parasitic Nematodes

Some plant-parasitic nematodes occur in every production field. Nematode populations likely include multiple species, although not all species cause notable disease. Symptoms depend on the species, the population density, and the crop's interaction with environmental factors. Several nematode species are known to cause disease in sunflower, although little research has focused on their impact or management in the crop.

The highest population densities of plant-parasitic nematodes often occur in isolated areas that are randomly distributed in fields, as do the most severe plant symptoms. Symptoms are not necessarily diagnostic for nematodes, and the problem may be misdiagnosed. The most common aboveground symptoms caused by nematodes include chlorosis (yellowing), stunting, and wilting during the day (with the plant recovering



Fig. 152. Stunting and wilting in discrete patches within a field, characteristic of nematode infection. (Courtesy R. M Harveson—© APS)



Fig. 153. Root-lesion nematodes (*Pratylenchus* spp.) can cause the development of minor to severe lesions and root necrosis on many crops (corn is pictured here), which allows infection by fungi and bacteria. (Courtesy T. A. Jackson-Ziems—© APS)

during evening hours) (Fig. 152). These symptoms may occur in isolated areas of fields associated with higher nematode population densities. Symptoms on roots are often overlooked but can be useful in making diagnoses, because they may implicate nematode damage as a potential cause and they vary by nematode species. Root symptoms caused by nematodes include lesions, misshaped roots (with stubby tips, enlarged galls, or unusual branching), and necrotic (dead) roots (Fig. 153). Any of these symptoms can mimic those caused by other biotic or abiotic stresses and should not be strictly relied on when making a diagnosis. Submitting soil and root samples to a laboratory for nematode analysis is necessary for an accurate diagnosis.

Mixed populations of plant-parasitic nematode species commonly occur in fields and in samples submitted for diagnoses. Because little research has been conducted on nematode interactions with one another and with other pathogens in sunflower, interpretation of nematode analyses may be subjective and require additional knowledge of growing conditions, crop rotation sequence, and other factors.

Following is a summary of some nematodes that have been documented to cause damage in sunflower. Special attention is given to root-knot and root-lesion nematodes, whose negative effects have been better documented.

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(Prepared by T. A. Jackson-Ziems)