RESISTANCE OF COMMON WEEDS IN HONDURAS TO *MELOIDOGYNE INCOGNITA*

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RESUMEN

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Ocho especies de malezas comunes en campos agrícolas en el valle Yeguare en Honduras, fueron evaluadas bajo condiciones del umbráculo, para determinar su reacción frente a una población de *Meloidogyne incognita*. Siete malezas fueron resistentes a *M. incognita*. Sin embargo, *Sclerocarpus phyllocephalus* permitió el crecimiento y reproducción del nematodo agallador. El sistema radicular de esta maleza puede ser usado para determinar la presencia de *Meloidogyne incognita* en campos agrícolas.

Palabras clave: malezas, *Meloidogyne incognita*, nematodo agallador, resistencia, *Sclerocarpus phyllocephalus*.

Root-knot nematodes [*Meloidogyne incognita* (Kofoid & White) Chitwood] cause considerable damage to many cucurbit crops (3), causing Honduran producers to rely on nematicide application to reduce nematode populations. As nematicide residues become less acceptable to foreign markets, and application becomes more expensive, producers are turning to alternative methods of production, including crop rotation within integrated pest management programs (9).

The presence of weeds in agricultural fields may determine the success of the rotation for nematode control. Weeds that support nematode growth and reproduction can reduce the beneficial effects of a nematode-resistant rotation crop (1). However, if weeds are resistant to plant-parasitic nematodes, they may be left in the field with no danger of increasing nematode populations. In addition, the roots of weeds known to be susceptible to root-knot nematodes can be used as indicators in fields to determine if the nematode is present. Therefore, knowledge of the susceptibility of common weed species in Honduras to *M. incognita* may not only aid producers in determining the necessity of weed control in their production schemes, but may also provide a means for rapid, easy recognition of the presence of root-knot nematodes in their fields.

In the Yeguare valley of Honduras, eight of the most common weeds found in agricultural fields in the region were identified. These weeds were tropic ageratum (*Ageratum conyzoides* L.), southern sandbur (*Cenchrus echiniatus* L.), *Sclerocarpus phyllocephalus* L., spanishneedle (*Bidens pilosa* L.), slender amaranth (*Amaranthus viridis* L.), goldenbutton (*Melampodium divaricatum* D.C.), purslane (*Portulaca oleracea* L.), and Johnsongrass (*Sorghum halepense* (L.) Pers.). Seeds were collected, germinated in vermiculite in the greenhouse, and after 5 days transplanted into sterilized soil in individual pots. Twelve plants of each species were inoculated with approximately 1 500 juveniles and eggs of *M. incognita* extracted from *Cucumis sativa* L. (cv. Poinsett-76) (7). Twelve plants of a susceptible cucumber variety (*C. sativa*) were also inoculated, and twelve left uninoculated as a control.

After 4, 8, and 12 weeks, the roots of three plants of each weed species were washed clean of soil and rated for the number of galls according to a standard root galling index (0 = none, 1 = 1–2, 2 = 3–10, 3 = 11–30, 4 = 31–100, 5 = >100 galls per root system) (5). Roots with galls were stained with Phloxine B (2) to facilitate detection of egg masses and rated positive or negative for nematode reproduction.

Galls were found only on cucumber plants and *S. phyllocephalus*. Although *S. phyllocephalus* had less galling than cucumber, it did support nematode development and reproduction. The average root galling indices (± standard deviation) for *S. phyllocephalus* were 3.7 (± 0.6), 3.7 (± 0.6), and 1.3 (± 0.6) after 4, 8, and 12 weeks, respectively. Nematode egg masses were evident on all three replicates for each sampling date. All inoculated cucumber plants had root galling indices of 5.0 for all sampling dates.

The absence of galls on the remaining five species does not necessarily mean they are immune to *M. incognita*. In fact, reproduction of *M. incognita* populations from other countries has been reported on *A. conyzoides, B. pilosa, C. echinatus*, and *P. oleracea* (4). *Amaranthus viridis* has also been found to support reproduction of *M. incognita*, but the small galls and egg masses produced on these roots indicate that the plant is a poor host for this nematode (6,8). Similarly, it is unlikely that these five plant species would support high levels of reproduction by the Honduran population tested, in view of the complete absence of galling.

Meloidogyne incognita is the most common species of *Meloidogyne* in Honduran cropland (10). The apparently high level of resistance of most of the weeds examined to *M. incognita* race 1 indicates that leaving these weeds in the field during a fallow or rotation probably will not increase *M. incognita* populations. The selection of weed control methods could therefore be based on potential competition of weeds when grown in association with rotation crops, rather than on nematode management. However, if *S. phyllocephalus* is present in a field planted to a root-knot nematode resistant crop, weed control would be necessary to prevent a large population increase of the nematode prior to planting of a nematode-susceptible crop.

Because of its susceptibility to galling when infected by *M. incognita* and its common occurrence in agricultural fields, *S. phyllocephalus* could serve as an indicator plant in Honduras to detect the presence of *M. incognita*.

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