WEB BLIGHT CAUSED BY THANATEPHORUS CUCUMERIS ON SOPHORA TOMENTOSA L.

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Abstract. Sophora tomentosa L., commonly known as necklace pod or silverbush, is a popular subtropical landscape tree grown only in southern Florida. Water-soaked leaf spots that increased rapidly in size and became light tan to brown necrotic areas were observed on carrotwood in commercial nurseries during periods of cloudy, rainy weather from July through September 1991 and 1992. Severe infections resulted in defoliation and death of plants. A Rhizoctonia-like fungus was isolated from infected leaves and stems on potato dextrose agar and was identified as Thanatephorus cucumeris (Frank) Donk, (anamorph of Rhizoctonia solani Kuhn).

Six month old plants of S. tomentosa were inoculated with hyphal suspensions of T. cucumeris, placed in a dew chamber at 27°C for 7 days, and observed for symptoms after 6 to 10 days. Foliar web blight symptoms on inoculated plants were identical in all respects to the blight resulting from natural infection. Koch’s postulates were fulfilled by reisolation of the pathogen.

Banrot, Chipco, Duosan, and Zyban fungicides applied as a protective spray provided significant disease control.

The fungus Thanatephorus cucumeris (Frank) Donk with Rhizoctonia solani Kuhn as its anamorph was first reported in 1918 (Chupp and Sherf 1960). Since then it has been observed in the Gulf States and as far north as Virginia, and in Brazil, Burma, India, Ceylon, Japan, and the Philippines (Chupp and Sherf 1960). The fungus attacks some 100 different types of plants, including both cultivated ones and weeds (Alfieri et al., 1991; Dwivedi and Dubey, 1987; Pirone, 1970; Preston, 1968; Sharma and Sankaran, 1984).

In south Florida T. cucumeris occurs on crops leaves, stems, and pods during the wet warm summer months. Recently, T. cucumeris was found on the stems and leaves of commercial nursery potted Sophora tomentosa L. commonly known as necklace pod or silverbush and Cupaniopsis anacardiopsis (McMillan, Vande Hei and Graves 1994; McMillan, Vande Hei and Graves 1994). The disease occurred as a severe blight affecting over 90% of 200 potted nursery stock during periods of cloudy, rainy weather from July through September of 1991 and 1992. Grade and standard reduction resulted from a severe foliage blight. This epiphytotic occurred during an abnormal period of excessive rainfall and high temperatures. The purpose of this research was to reproduce the disease and to determine effective methods of control.

Materials and Methods

A culture of T. cucumeris originally isolated from natural infected S. tomentosa was transferred periodically on potato-dextrose agar and maintained at 22°C. This isolate was employed throughout this study.

All inoculations were accomplished by inoculating six-month-old plant of S. tomentosa with a 5-day-old hyphal suspension of T. cucumeris, placing plants in a dew chamber at 27°C for 7 days, and observing for symptoms after 6 to 10 days.

Four fungicides were evaluated for disease control in a commercial nursery. The field trial consisted of 10 six-month-old plants per treatment sprayed five times with the candidate fungicides at 7-day intervals. Plants were inoculated as described for greenhouse studies, 2 days after the first spray application. The compounds were Banrot [ethazol; methyl thiophanate; (Dimethyl 4, 4'-o-phenylene bis (3-thioallophanate)], Chipco (ipriodione), Duosan (maneb, methyl thiophanate), and Zyban [dimethyl 4,4'-o-phenylene bis (3-thioallophanate) (ethylene bis dithiocarbamate with zinc and managanese)]. The control treatments were sprayed with water.

Results and Discussion

The leaf, twig blight and sclerotia which resulted from inoculation of S. tomentosa in the greenhouse and in the field were identical in respect to those resulting from natural infection. Thanatephorus cucumeris was reisolated consistently from the disease tissue.

Disease symptoms were first noted on the leaves 6 to 10 days after inoculation and began as small circular spots that appeared water-soaked or scalded. The spots enlarged to 25 mm or more, became tan with a darker border, sometimes zonated. The whitish mycelium grew rapidly over the leaf, killing them, and spread a web from leaf to leaf, over the stems. Many small brown sclerotia and abundant web like mycelium were formed on the stems and leaves.

All of the fungicides applied as a protective spray were significantly better than the control (Table 1). Banrot, Chipco and Duosan resulted in slight but consistently better disease control than did Zyban, which was significantly better than the inoculated control. All of the fungicides reported must be applied as per the manufactures label.

Table 1. Efficacy of four fungicides, Banrot Chipco, Duosan, and Zyban, applied as a protectant spray to control Thanatephorus cucumeris on Sophora tomentosa.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Rate/380 liters</th>
<th>Percent Disease*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banrot</td>
<td>170.1 g</td>
<td>8.7a</td>
</tr>
<tr>
<td>Chipco</td>
<td>113.4 g</td>
<td>8.8a</td>
</tr>
<tr>
<td>Duosan</td>
<td>10.9 kg</td>
<td>9.2ab</td>
</tr>
<tr>
<td>Zyban</td>
<td>10.9 kg</td>
<td>11.8b</td>
</tr>
<tr>
<td>Untreated Control</td>
<td>11.8b</td>
<td>62.7c</td>
</tr>
</tbody>
</table>

*Average of 10 replications. Data taken 10 days after last application.

Means followed by the same letters are not significantly different at the 1% level according to the Duncan-Waller Multiple Range Test.

Materials and Methods

A culture of T. cucumeris originally isolated from natural infected S. tomentosa was transferred periodically on potato-

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WEB BLIGHT CAUSED BY THANATEPHORUS CUCUMERIS ON CUPANIOPSIS ANACARDIOPSIS

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Abstract. Cupaniopsis anacardiopsis (A. Rich) Radlk., commonly known as carrot-wood, is a popular subtropical landscape tree grown only in southern Florida. Water-soaked leaf spots that increased rapidly in size and became light tan to brown necrotic areas were observed on carrotwood in commercial nurseries during periods of cloudy, rainy weather from July through September of 1991 and 1992. Severe infections resulted in defoliation and death of plants. A Rhizoctonia-like fungus was isolated from infected leaves and stems on potato dextrose agar and was identified as Thanatephorus cucumeris (Frank) Donk, (anamorph of Rhizoctonia solani Kuhn). Eight month old plants of C. anacardiopsis were inoculated with hyphal suspensions of T. cucumeris, placed in a dew chamber at 27°C for 7 days, and observed for symptoms after 10 days. Foliar web blight symptoms on inoculated plants were identical in all respects to the blight resulting from natural infection. Koch's postulates were fulfilled by reisolation of the pathogen. Banrot, Chipco, Duosan, and Zyban fungicides applied as a protective spray provided significant T. cucumeris control.

The fungus Thanatephorus cucumeris (Frank) Donk with Rhizoctonia solani Kuhn as its anamorph was first reported in 1918 (Chupp and Sherf, 1960). Since then it has been observed in the Gulf States and as far north as Virginia, and in Brazil, Burma, India, Ceylon, Japan, and the Philippines (Chupp and Sherf, 1960). The fungus attacks some 100 different types of plants, including both cultivated ones and weeds (Alfieri et al., 1991; Dwivedi and Dubey, 1987; Pirone, 1970; Preston, 1968; Sharma and Sankaran, 1984). In south Florida T. cucumeris occurs on crops leaves and stems during the wet warm summer months. Recently, T. cucumeris was found on the stems and leaves of commercial nursery potted Cupaniopsis anacardiopsis (A. Rich) Radlk., carrotwood and Sophora tomentosa L., commonly known as necklace pod or silverbush. (McMillan, Vande Hei and Graves, 1994; McMillan, Vande Hei and Graves, 1994). The disease occurred as a severe blight affecting over 90% of 500 potted nursery stock during periods of cloudy, rainy weather from July through September of 1991 and 1992. Grade and standard reduction resulted from a severe foliage blight. This epiphytotic occurred during an abnormal period of excessive rainfall and high temperatures. The purpose of this research was to reproduce the disease and to determine effective methods of control.

Materials and Methods

A culture of T. cucumeris originally isolated from natural infected C. anacardiopsis was transferred periodically on potato-dextrose agar and maintained at 22°C. This isolate was employed throughout this study. All inoculations were accomplished by inoculating six-month-old plant of C. anacardiopsis with a 3-day-old hyphal suspension of T. cucumeris, placed in a dew chamber at 27°C for 7 days, and observed for symptoms after 10 days.

Four fungicides were evaluated for disease control in a commercial nursery. The field trial consisted of 10 eight-month-old plants per treatment sprayed five times with the candidate fungicides at 7-day intervals. Plants were inoculated as described for greenhouse studies 2 days after the first spray application. The compounds were Banrot [ethazol; methyl thiophanate; (Dimethyl 4, 4'-o-phenylene bis (3-thioallophanate)], Chipco (iprodione), Duosan (maneb, methyl thiophanate), and Zyban [dimethyl 4,4'-o-phenylene bis (3-thioallophanate)] (ethylene bis dithiocarbamate with zinc and manganese). The control treatments were sprayed with water.

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