Proc. Fla. State Hort. Soc. 117:318-320. 2004.

RHIZOCTONIA BLIGHT OF IMPATIENS AND ITS CONTROL

ROBERT T. MCMILLAN, JR.[1], STEVE V. JOHNSON
AND WILLIAM R. GRAVES
University of Florida, TREC
18905 SW 280th Street
Homestead, FL 33031

Additional index words. Impatiens hawkeri, foliar disease, plant pathogens

Abstract. **An outbreak of a foliar disease on New Guinea impatiens (*Impatiens hawkeri* Bull) was observed in a nursery in Dade County, Florida. Symptoms on leaves were water-soaked spots that increased rapidly in size and became light to dark brown necrotic areas. A Rhizoctonia-like fungus was isolated from infected leaves and stems on corn meal agar subcultured on potato-dextrose agar and identified as *Thanatephorus cucumeris* (Frank) Donk (anamorph *Rhizoctonia solani* Kuehn). Six plants were randomly inoculated with agar blocks containing the isolate. Control plants received agar blocks without the pathogen. Plants were placed in a modified humidity chamber (polyethylene bags) for 48 hours and then transferred to a greenhouse at 27 °C. The symptoms appeared as water soaked spots, 10mm in diameter, that enlarged to 25mm or more and turned dark brown. A mycelial web grew over the leaves, killing them, and spreading from leaf to leaf. Small brown sclerotia and mycelium were found on leaves and stems, typical of that found on nursery plants. *Thanatephorus cucumeris* was consistently re-isolated from inoculated plants with no symptoms observed on uninoculated plants, fulfilling Koch's postulates.**

The fungus *Thanatephorus cucumeris* (Frank) Donk with *Rhizoctonia solani* Kuehn 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). Currently south Florida has approximately 400 acres devoted to the production of flowering annual landscape plants. In south Florida *T. cucumeris* occurs on crops leaves, stems and pods during the wet warm summer months. Over the past years *T. cucumeris* was found on the stems and leaves of commercial nursery potted *Sophora tomentosa* L. commonly known as silverbush (McMillan et al., 1994) and *Cupaniopsis anacardiopsis*, carrot-wood, (McMillan et al., 1994), *Breynia distichia* L., Dwarf Hawaiian Snowbush (McMillan et al., 1997) and *Arachniodes simplicor* "variegata" (Mak.) Ohwi, East India Holly Fern (Wood et al., In Press). In Florida, New Guinea impatiens is grown in the winter as a bedding plant. An outbreak of a foliar disease on *I. hawkeri* was first observed in December of 1999 in a large commercial nursery in Dade County, Fla. *Rhizoctonia. solani* was positively identified as the cause of web blight on the New Guinea impatiens with 10% of the grower's crop infected and showing extensive necrotic areas on the leaves and stems rendering the plants unmarketable. This pathogen presents a serious and continuing problem to growers. The purpose of this study was to reproduce the disease in *I. hawkeri* and prove Koch's postulates.

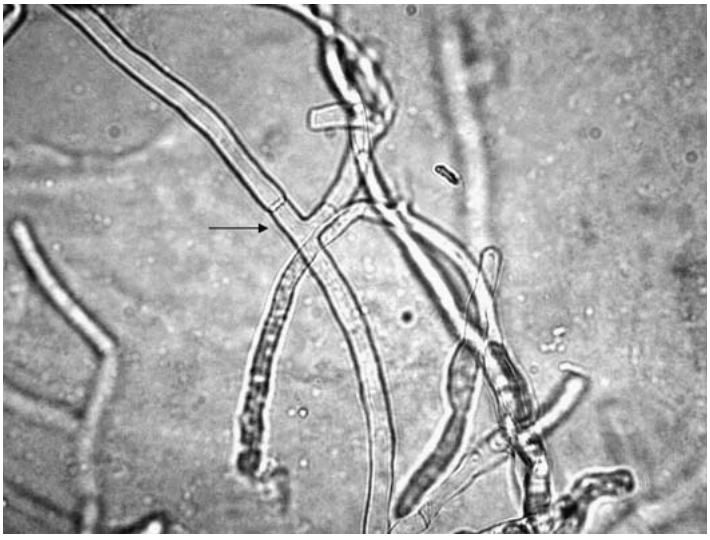

Fig. 1. Rhizoctonia mycelial strand showing foot cell.

Materials and Methods

A culture of *T. cucumeris* (Fig. 1) originally isolated from naturally infected *I. hawkeri* on corn meal agar with 100 mg of chloramphenical per L and was transferred periodically on ½ strength potato dextrose agar, maintained at 22 °C. This isolate was employed throughout this study. Sixty four plants were obtained from a commercial nursery that had not been treated with any fungicide. Four plants were misted with water and randomly inoculated with 3 × 3 mm agar blocks containing the isolate (Fig. 2). Four control plants were misted with

Fig. 2. Rhizoctonia inoculated plug resting on Impatien leaflet.

This research was supported by the Florida Agriculture Experiment Station, and approved for publication as Journal Series No. N-02557.

[1]Corresponding author.

Fig. 3. Uninoculated control plug resting on Impatien leaf.

water and received agar blocks without the pathogen (Fig. 3). All plants were placed in a modified humidity chamber (sealed polyethylene bags) (Fig. 4) for 48 h and then placed in a greenhouse at 27 °C. The bags were removed and the plants were observed daily for disease symptoms. After 3 d necrotic lesions became visible on the inoculated plants (Fig. 5).

Fig. 4. Inoculated Impatien plant in humidity chamber.

Fig. 5. Rhizoctonia inoculated Impatien showing advanced leaf necrosis.

Three fungicides, aebuconozole, azoxystrobin, and clorothalonil were applied as foliar sprays using a pressurized hand sprayer at 60 GPA and 30 psi, at a rate equivalent to 100 gal/acre. The plants were evaluated for Rhizoctonia web blight on 30 Mar. 2002.

Results and Discussion

The disease symptoms appeared as water soaked spots 10 mm in diameter. The spots enlarged to 25 mm or more and turned dark brown. A whitish mycelium grew rapidly over the leaves, killing them, and spread a mycelial web from leaf to leaf. Many small brown sclerotia and web-like mycelium were found on the leaves, typical of the disease symptoms found on the infected nursery plants. *T. cucumeris* was consistently reisolated from all of the inoculated plants while no symptoms were observed on the uninoculated plants (Fig. 1). Thus Kock's postulates were there by fulfilled. Commercial production of New Guinea Impatiens where the crop is grown on gravel or ground cover on the soil is a serious problem since the pathogen is in close proximity to the plant at all times. Bench production of the plants to remove them from immediate exposure would be cost prohibited.

All chemicals applied resulted in significantly reduced the number of leaves infected with *R. solani* compared to untreat-

Table 1. Fungicide efficacy for Rhizoctonia web blight caused by *Rhizoctonia solani* on New Guinea Impatiens.

Product	Rate/acre[w]	% Web blight[xyz]
Control		83.9 d
Tebuconazole	4.0 oz/A	3.5 b
Tebuconazole	6.0 oz/A	0.2 a
Azoxystrobin	4.2 oz/A	3.3 b
Azoxystrobin	6.2 oz/A	0.3 a
Chlorothalonil	3.0 pts/A	24.4 c

[w]All applications were applied foliar.
[x]Means with the same letter are not significantly different at the DWMRT, 5% level.
[y]Disease severity evaluation was made after the final harvest on an index of 0 to 10 where 0 = no disease and 10 = 100% disease.
[z]Percent leaf spot was made on mean number of leaves infected out of 20 plants per treatment.

ed check (Table 1.). Tebuconazole at 6 oz and azoxystrobin at 6.2 oz were significantly better than tebuconazole at 4 oz, azoxystrobin at 4.2 oz, chlorothalonil.

Literature Cited

Alfieri, S. A., Jr., K. R. Langdon, J. W. Kimbrough, N. E. El-Gholl, and C. Whelburg. 1991. Disease and Disorders and Plants in Florida. Bulletin No. 14. Fla. Dept. of Agr. and Consumer Ser., Div. of Plant Industry.

Chupp, C. and A. F. Sherf. 1960. Vegetable disease and their control. Ronald Press, New York. 692 pp.

Dwivedi, R. P. and S. C. Dubey. 1987. Web blight of *Eupatorium cannabinum* L. caused by *Thanatephorus cucumeris*. Indian J. Mycol. Plant Pathol. 161:309.

McMillan, R. T., Jr., H. Vande Hei, and W. R. Graves. 1994. First report of web blight caused by *Thanatephorus cucumeris* on *Cupaniopsis anacardiopsis* in the United States. Plant Dis. 78:317.

McMillan, R. T., Jr., H. Vande Hei, and W. R. Graves. 1994. First report of web blight caused by *Thanatephorus cucumeris* on *Sophora tomentosa* in the United States. Plant Dis. 78:317.

McMillan, R. T., Jr., H. Vande Hei, and W. R. Graves. 1994. First report of web blight caused by *Thanatephorus cucumeris* on *Cupaniop*sis *anacardiopsis* in the United States. Plant Dis. 78:317.

McMillan, R. T., Jr., M. Borek, and W. R. Graves. 1997. Web blight of dwarf Hawaiian snowbush. Proc. Fla. State Hort. Soc. 110:370.

McMillan, R. T., Jr., Wood, T. F., IV, and W. R. Graves. 2001. Web blight of East India Holly fern caused by *Rhizoctonia solani*. Phytopathology 91:S61. Publication no. P-2001-042-AMA.

Pirone, P. P. 1970. Diseases and Pests of Ornamental Plants. Ronald Press, New York. 546 pp.

Preston, D. A. 1968. Host index of Oklahoma plant diseases supplement, 1948. Plant Dis Reptr. 32:398-401.

Sharma, J. K. and K. V. Sankaran. 1984. Rhizoctonia web blight of *Albizia falcataria* in India. Eur. J. Forest Pathol. 38:261-264.

Wood, T. F., IV, R. T. McMillan, Jr., and W. R. Graves. 2002. Web blight caused by *Rhizoctonia solani* of East India Holly fern. Proc. Fla. State Hort. Soc. (In press).