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CHARLIE PARKERSON: Thank you, Dr. Swanson. I'm real excited about our next speaker because we've been having problems for the past 4 or 5 years with the subject he will be discussing. The paper deals with root-rot of rhododendrons and will be presented by Dr. Harry Hoitink.

RECENT DEVELOPMENTS IN CONTROL OF RHODODENDRON ROOT ROT[1]

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Rhododendron root rot has been a serious disease in both landscape planting and nurseries for decades. Several *Phytophthora* spp. can cause this disease; however, *P. cinnamomi* is encountered most frequently. The disease typically occurs on plants in poorly-drained soils or container media. Differences in susceptibility exist among cultivars, but only a few hybrids are resistant. Most popular hybrids are susceptible (3). Moderately resistant cultivars are available, however these become infected and die after prolonged exposure to high tempera-

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ture in soils with poor drainage that are infested with the pathogen. After short periods of high moisture and temperature such infected plants recover by regenerating new roots from the crown.

Recently, the disease has disappeared in nurseries where proper sanitation procedures are used during propagation and where container mixes consist largely of composted hardwood bark. The disease still is present in nurseries that use container media consisting largely of peat or which produce plants on heavy soils.

BARK CONTAINER MEDIA FOR ROOT ROT CONTROL

During the 1972, 73, and 74 growing seasons *Rhododendron* 'Roseum Elegans' were produced experimentally in three different container media consisting of the following components:

(a) Hammermilled hardwood bark and sharp silica sand (2:1 v/v) (2).

(b) Canadian peat and sharp silica sand (3:2 v/v) with 5 lb. of superphosphate, 15 lb. dolomite, 3 lb. GU-49 (iron) and 1.5 lb. fritted trace elements per cu yd added; and

(c) Canadian peat, Haydite B-grade and sharp silica sand (7:2:1 v/v) with fertilizer as in b. The percentages drained airspace (1) in these media were approximately 20, 14, and 20, respectively.The pH of the media varied from 6.0-6.4. *P. cinnamomi* was isolated from plants growing in the peat-sand mix. However no root rot was observed on plants produced in the bark or Haydite mixes. Furthermore, shoot and root growth were considerably superior in these mixes. Possible explanations for the absence of root rot in these mixes are the superior aeration and drainage properties as compared to that of the peat mix. This effect of airspace on incidence of *P. cinnamomi* root rot has been demonstrated for the little-leaf disease of pine (5).

Other factors that might be involved in the lower root rot incidence in bark as compared to the peat mix could be the presence of inhibitory chemicals or microorganism. *Trichoderma*, a hyperparasite of some fungal pathogens, colonizes bark during the composting procedure. Furthermore, it has been shown that hardwood bark suppresses populations of plant parasitic nematodes in container media (4).

To investigate the possible role of inhibitors in bark media for control of root rot, two types of experiments were performed. During the summer of 1972 chlamydospore inoculum of *P. cinnamomi* was poured adjacent to roots of plants in bark, peat and Haydite mixes (4 reps of 6 plants/mix). Plants in all mixes died within 4 weeks after inoculation, indicating that infections cokld occur in these media. In another experiment rhododendrons (1 gal size, 4 reps of 5 'Roseum Elegans' plants) were placed in trays and watered heavily until a 2 cm deep water layer accumulated around the base of each container plant. Zoospores were released in 24 hr from sporangia produced by chlamydospore inoculum placed in the water at the base of plants in each mix. The lower edge of the roots of these plants was 10 cm above the level of the zoospore suspension. *P. cinnamomi* was isolated with a lupine seedling baiting assay from all mixes at various heights above the water level at one week after inoculation. Some of the plants were eventually killed. There was no difference in numbers of plants killed per treatment. In these two types of inoculation studies therefore no evidence was obtained for the presence of inhibitors in the bark or Haydite mix. In these types of experiments, however, inoculum potentials may significantly affect the end result. More information is needed therefore to fully elucidate the role of inhibitors in preventing this root rot complex.

CHEMICAL CONTROL

Few chemicals are available for control of root rot in established plantings. Although Dexon has been recommended for control on avocado, it is not effective on rhododendron. Truban is recommended for control; however, the recommended rate is only partially effective. Recently, it has been shown that one drench with Truban 25% E.C. (12-18 fl oz/100 gal) controls rhododendron root rot.

A new experimental fungicide, Nurelle (Dowco 269) is as effective as Truban, if applied as a drench. Several foliar sprays with Nurelle also have controlled rhododendron root rot. Apparently, this fungicide is translocated from the foliage to the roots where it prevents infection. More information is needed to fully substantiate this.

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