110

* VARIATION IN AGGRESSIVENESS OF *SPHAEROPSIS SAPINEA* MORPHOTYPES ON RED AND JACK PINE. J.T. Blodgett and G.R. Stanosz, Dept. of Plant Path., Univ. of Wisconsin-Madison, 53706.

Sphaeropsis sapinea (syn. *Diplodia pinea*) causes a shoot blight and canker disease of various conifers. Two *S. sapinea* morphotypes ("A" and "B") are recognized and have been suggested to differ in the requirement for wounds to penetrate hosts and in virulence. The aggressiveness of "A" and "B" isolates were compared on wounded and unwounded seedlings of red (*Pinus resinosa*) and jack pine (*Pinus banksiana*) in the greenhouse. Growing shoots tips of two-year old seedlings were inoculated by placing a colonized agar plug on a wound made by removing a needle fascicle. Unwounded growing shoot tips of one-year-old seedlings were inoculated with 0.4 ml of a conidial suspension (0.5×10^4 spores/ml). Nine "A" and eight "B" isolates were used for wound inoculations and five isolates of each morphotype were used in conidial inoculations. Both methods resulted in some symptom development in red and jack pines inoculated with either "A" or "B" isolates. However, both pine species were more severely affected by "A" isolates than by "B" isolates. This difference was more pronounced for red pines. The large difference in severity of symptoms induced following wound-inoculation of red pine seedlings allows differentiation of isolate morphotype based on host response.

111

INCREASED PERMEABILITY OF CONIFER SAPWOOD DURING INCIPIENT BROWN-ROT DECAY. F. GREEN, III, J. Tschernitz, T.A. Kuster and T.L. Highley, Forest Products Laboratory, One Gifford Pinchot Dr., Madison, WI 53705-2398.

The permeability of a wood species is primarily a function of the flow rate through pit pores. Pit membranes have been shown to be hydrolyzed by commercial pectinases. Brown-rot fungi produce oxalic acid, and have recently been shown to induce polygalacturonase to pectin. Douglas fir and Southern pine cores were inoculated with P. placenta, G. trabeum, S. incrassata, A. niger or Trichoderma sp. in ASTM soil block tests. Increase to maximum permeability over the first two weeks indicates rapid hydrolysis of pit membranes. Results were confirmed by SEM. We conclude pit hydrolysis is integral to rapid spread of brown-rot decay.

112

EFFECT OF FOREST TENT CATERPILLAR AND DISCULA CAMPESTRIS ON SUGAR MAPLE IN PENNSYLVANIA IN 1994. T.J. Hall, Division of Forest Pest Management, Bureau of Forestry, Middletown, PA. 17057-5021.

Severe defoliation caused by *Malacosoma disstria* and other native insect defoliators was observed on *Acer saccharum* in many northern hardwood stands in northern and south-central Pennsylvania in 1994. Subsequent refoliation of trees in affected stands was extremely poor; field examination of felled maples revealed symptoms of leaf anthracnose and blight of leaf, bud, and twig tissue. Microscopic examination revealed conidiomata of *Discula campestris* on leaves, petioles, and twigs. The disease outbreak was associated with unusually moist weather conditions in the affected regions from mid-July through October. Affected stands exhibited extensive crown dieback and potential for significant tree mortality in 1995.

113

FUSARIUM PROLIFERATUM IS A COMMON, AGGRESSIVE PATHOGEN OF CONTAINER-GROWN CONIFER SEEDLINGS. **R. L. James[1], R. K. Dumroese[2], and D. L. Wenny[2]. [1]USDA Forest Service, Insect and Disease Mgt., Coeur d'Alene, ID 83814. [2]Forest Research Nursery, University of Idaho, Moscow, ID 83844.**

Fusarium proliferatum is consistently isolated from roots of diseased and non-diseased container-grown conifer seedlings within nursery greenhouses in the Inland Pacific Northwest. Many conifer species are affected, but Douglas-fir is often severely impacted. F. proliferatum is usually not seed-borne on conifers and increases in abundance on roots as seedlings become older. Inoculum may reside within containers and spread through the air within greenhouses. Pathogenicity tests indicate little variability among isolates with most being very aggressive, causing damping-off and root disease. Control efforts center around reducing inoculum and maintaining high host vigor.

115

CHEMICAL TREATMENT OF EASTERN WHITE PINE SEEDS FOR REMOVAL OF *FUSARIUM* PROPAGULES. Cynthia M. Ocamb, USDA Forest Service, North Central Forest Experiment Station, 1992 Folwell Ave., St. Paul, MN 55108

Chemical treatments were examined for disinfestation of eastern white pine (*Pinus strobus*) seeds of *Fusarium* propagules. Unstratified seeds were rinsed in running tap water for 48 hr; agitated in 3 % H_2O_2 for 3 hr, 2 % NaOCl for 10 min, or 0.5 % NaOCl for 10, 20 or 40 min; or left untreated. Three hundred seeds in each treatment were assayed for presence of *Fusarium* species and an additional 150 seeds per treatment were stratified and tested for germinability. Germination levels of chemically-treated seeds were the same as the untreated seeds. Ninety percent of untreated seed were infested with *Fusarium* species. Infestation levels were 4 % for 3 % H_2O_2-treated seed; 14 % for seeds agitated in 2 % NaOCl for 10 min; 50, 41, and 30 % when seeds were agitated in 0.5 % NaOCl for 10, 20, and 40 min, respectively; and 29 % for seeds receiving only a 48-hr rinse. Use of 3 % H_2O_2 for white pine seed disinfestation can significantly reduce pathogen introduction. Disinfesting seed of *Fusarium* spp. may improve performance of seed-applied biological control agents.

116

FUSIFORM RUST SPORE GERMINATION BEHAVIOR ON HOST AND NON-HOST SURFACES. P. Spaine, S. Kaneko, J. Kerrigan, B. Richardson, and S. Covert. USDA, Forest Service, Athens, GA 30602; FFPRI, Tsukuba, Japan; Univ. of GA, Athens, GA 30602.

The germination responses of Cronartium quercuum (Berk.) Miyabe ex Shirai f. sp. fusiforme basidiospores (bs) and urediniospores (us) were quantified on host (pine and oak) and non-host surfaces of glass, plastic, 2% water agar and dialysis membrane on agar. Directly-cast bs had 67% direct germination on pine, 56% on membrane, and 25% on the non-host, oak. However, there was a 5-fold increase in indirect germination of bs on oak (50%) compared to pine (10%). Washing the bs increased the %of direct germination on pine and membrane (70% and 93%), but decreased indirect germination on oak (5%). Unwashed us germinated well on membrane and oak surfaces (73% and 48%). Dialysis membrane performed well as an alternative germination surface in all treatments (56-96%).

117

FREQUENT AND RAPID EVOLUTION OF HOST RANGE AMONG SPECIES OF *CYTOSPORA*, CANKER PATHOGENS OF TREES. **G. C. Adams, Michigan State University, Department of Botany & Plant Pathology, East Lansing, Michigan 48824.**

A phylogenetic tree based on DNA sequence provides evidence that individual species of *Cytospora* pathogenic on gymnosperms are most closely related to individual species pathogenic on angiosperms. The relationship reoccurs in terminal taxa in separate clades (groups). Examples of such pairs include: *C. sequoiae/C. magnoliae, C. abietis/C. personata, C. friesii/C. fugax, and C. curreyi/C. cincta*. Many conifer pathogens had been grouped by taxonomists in section Microsporae based on small ascospores. Small ascospores may be a host-influenced character originating with natural selection and convergence.