

Discula destructiva, the causal agent of Dogwood Anthracnose, is currently in several native stands of *Cornus florida* in Michigan. Infected stands occur in the municipalities of Kalamazoo, Paw Paw, Muskegon, Grand Rapids and Augusta and have been infected for approximately 12, 6, 5, 5 and 2 years; respectively. Infected stands are generally located near landscaped suburban housing and likely became infected from imported nursery stock planted nearby. Microscopic examination of fruiting bodies on dead twigs has revealed *D. destructiva* on *C. florida* and *C. kousa* being imported from several states. Spread of the disease appears limited in Michigan by the fragmented nature of the natural dogwood stands. Isolates from previously infected stands, newly infected stands, and incoming nursery stock are being characterized using molecular markers. AFLPs and RFLPs have shown differences in origin among isolates causing individual stand infection.

Evaluation of fungicide applications for management of Cercospora leaf spot on sugar beets. E. S. Blehm and R. M. HARVESON. University of Nebraska Panhandle Research and Extension Center, Scottsbluff, NE 69361. Phytopathology 92:S8. Publication no. P-2002-0051-AMA.

Experiments were conducted at the Panhandle Research and Extension Center, Scottsbluff, NE during 2000-2001. The objective was to compare the efficacy of systemic and protectant fungicides for managing *Cercospora* leaf spot of sugar beets. Both studies relied upon natural infection, and disease development was monitored with leaf severity ratings using a non-linear scale of 0-9. Additional data collected from both studies included root and sucrose yields, and sugar percentage. The 2000 study was furrow irrigated and the 2001 study was sprinkler irrigated. Significant disease severity differences were observed for all treatments in both years compared to controls, but yield differences were only observed in 2001. This is presumably due to more favorable conditions for disease in 2001. Both studies suggest that the timing of application is more influential in reducing disease than the type of fungicide used, and that early fungicide application is crucial during years when the environment is favorable for severe disease development.

Pythium stem canker on grain amaranth. C. C. BLOCK (1), J. W. Van Roekel (1), and L. Robertson (2). (1) USDA-ARS-NCRPIS, Iowa State University, Ames, IA 50011; (2) Dept. Plant Pathology, North Carolina State University, Raleigh, NC 27695. Phytopathology 92:S8. Publication no. P-2002-0052-AMA.

An unusual stem canker was observed on mature grain amaranth plants (Plainsman cultivar) in Nebraska and Missouri production fields during August 2000 and in Iowa plots during 2000 and 2001. Dry, tan cankers with thick black borders, similar in appearance to blackleg of crucifers, developed near the soil line. The cankers often spread 15-45 cm up the stems. In attempts to identify the causal agent, we isolated several *Phoma*-like fungi along with *Pythium* spp. Each isolate was tested for pathogenicity on greenhouse plants by drilling small holes in the stems, introducing fungal mycelium, and sealing with petrolatum. Plants were observed for 6 weeks, but only the *Pythium* isolates caused disease, usually within 4-7 days. Canker symptoms were also demonstrated on plants grown in potting mix amended with the *Pythium* cultures. All of the isolates were identified as *P. aphanidermatum*, which has been reported from amaranth, but is usually associated with a soft, basal stem rot. One *Pythium* isolate was derived from a basal stem rot, but did cause stem canker symptoms when inoculated onto Plainsman plants.

✳ Induction of systemic resistance/susceptibility in *Pinus nigra* inoculated with *Sphaeropsis sapinea*. J. T. BLODGETT, M. Bellizzi, and P. Bonello. Dept. of Plant Pathology, Ohio State Univ., Columbus, OH 43210. Phytopathology 92:S8. Publication no. P-2002-0053-AMA.

The objective of this study was to test if inoculation of Austrian pines (*Pinus nigra*) with the fungal pathogen *Sphaeropsis sapinea* results in systemic induced resistance or susceptibility to subsequent colonization by *S. sapinea*. Six-year-old, greenhouse-grown Austrian pines were wounded at the stem base and treated with either the A or B morphotypes of *S. sapinea* (inducing inoculum); control trees were mock inoculated. At 21 days, the pines were challenge inoculated with either an A isolate or mock inoculated, on either: 1) the stem, 25 cm above the initial treatment sites; or 2) branch tips. Inoculation at the stem base with either morphotype significantly ($P < 0.001$) induced resistance in the upper stem. However, inoculation at the stem base significantly ($P < 0.001$) induced susceptibility in shoot tips, with the less aggressive B morphotype inducing inoculum stimulating greater susceptibility. This study describes a novel phenomenon in which the same pine host displays either systemic induced resistance or systemic induced susceptibility to the same pathogen, depending on the site of secondary infection.

PCR-detection of fumonisin- and trichothecene-producing *Fusarium* species. B. H. BLUHM, J. E. Flaherty, and C. P. Woloshuk. Dept. Botany and Plant Pathology, Purdue University, West Lafayette, IN 47907. Phytopathology 92:S8. Publication no. P-2002-0054-AMA.

Fumonisin and trichothecene mycotoxins pose serious health risks to animals and humans. A method to rapidly detect fungi that produce these mycotoxins in raw commodities is needed by the food processing industry. We are exploring a PCR-based detection strategy using three *Fusarium*-specific primer sets: one specific for the internal transcribed spacer (ITS) region of rDNA; the second specific for the *TRI6* gene involved in trichothecene biosynthesis; and the third specific for the *FUM5* gene involved in fumonisin biosynthesis. Primer specificity was tested on genomic DNA isolated from 43 fungal species representing 14 genera, including 9 *Aspergillus* spp., 9 *Fusarium* spp., and 11 *Penicillium* spp. The detection limit for the ITS primer set was 10 pg of template DNA, while the *FUM5* and *TRI6* primer sets required at least 0.1 ng and 1 ng of template DNA, respectively. To apply the PCR technique to food analysis, we have developed a simple and rapid protocol to extract fungal DNA from cornmeal.

A one-step polymerase chain reaction protocol using soybean seed for marker assisted selection of disease resistance in soybean. M. BOLTON (1), B. Nelson (1), R. Sparks (2), and A. Santoso (2). (1) Dept. Plant Pathology; (2) Biochemistry and Molecular Biology, North Dakota State University, Fargo, ND 58105. Phytopathology 92:S8. Publication no. P-2002-0055-AMA.

Host resistance is the preferred method to control important soybean pathogens such as *Heterodera glycines* and *Phytophthora sojae*. An improved marker assisted selection protocol utilizing DNA from soybean seed that implements a one-step polymerase chain reaction (PCR) process was developed to detect resistance to these pathogens. The protocol was based on a disk-based DNA purification and amplification procedure developed for soybean leaves, but the PCR denaturing and annealing times were changed to adapt the protocol to seed DNA. The DNA was amplified using micro-satellite (simple sequence repeats [SSR]) primers Satt309 and Sat_168 to detect the *rhg 1* SCN resistance gene and Satt 159 and Satt 152 to detect the *Rps 1* *Phytophthora* resistance gene. This seed DNA protocol resulted in consistent visualization of SSR markers for resistance to *H. glycines* and *P. sojae*.

Storage of fungal spores on petroleum jelly. M. G. BOOSALIS, J. E. Partridge, R. Higgins, K. Powers, and J. R. Steadman. Dept. Plant Pathology, Univ. of Nebraska. Lincoln, NE 68583-0722. Phytopathology 92:S8. Publication no. P-2002-0056-AMA.

Petroleum jelly (PJ), also labeled Vaseline, is an excellent substrate for long-term storage of fungal spores. No special equipment is needed. Spores are simply collected, placed on sterile PJ in glass petri dishes stored at 15-17°C. In ongoing experiments ascospores, chlamydoconidia and conidia of *Sclerotinia sclerotiorum*; *Ustilago trititica*; and *Alternaria* sp., respectively, maintained viability up to 6 years on PJ. Viability in storage varies with species: *Fusarium solani* macroconidia (40% viable after 4 yrs), *Cercospora maydis* conidia (less than 10% viable after 4 yrs), and urediniospores of *Puccinia graminis* f. sp. *tritici* and *Puccinia recondita* (only months). We have been unable to identify a universal factor that determines amenability to this storage method. For those isolates that are amenable, this method provides a convenient and inexpensive way to maintain viable fungal cultures.

Winter fungicide applications for improved control of black spot of rose in Alabama. K. L. Bowen. Dept. of Entomology and Plant Pathology, Auburn University, AL 36849-5409. Phytopathology 92:S8. Publication no. P-2002-0057-AMA.

Control strategies for black spot based on winter fungicide applications were evaluated on hybrid tea roses in Alabama. Four winter treatments (tetraconazole, triforine, myclobutanil, and non-treated) were arranged factorially with five foliar treatments applied through the growing season. Growing season fungicide treatments included: chlorothalonil, tetraconazole, triforine, and myclobutanil applied on 14-day intervals, and chlorothalonil applied on 7-day intervals, from 1 May through 1 September. Plants were rated every two weeks for disease severity, defoliation, vigor and flower production and averaged over the season. Disease levels in May of each year indicated that winter applications of tetraconazole reduced disease severity compared to other winter treatments, and this disease reduction persisted through the 2000 growing season. Average plant vigor did not differ among winter treatments. There were no significant interactions on disease, defoliation, vigor or flowers for the winter X growing season treatments.