* **Infection, colonization, and disease of *Amaranthus hybridus* by *Alternaria tenuissima*.** J. T. BLODGETT, W. J. Swart, C. M. Bender, and Weiqun Chen. University of the Orange Free State, Bloemfontein, South Africa. Phytopathology 89:S8. Publication no. P-1999-0049-AMA.

Amaranthus hybridus is a leafy-vegetable crop with potential for cultivation in semi-arid regions of the world. The study objectives were to identify foliar fungi in the crop, test pathogenicity, and determine infection and colonization patterns of leaf tissue. *A. hybridus* plants were sampled from two sites in South Africa. The most common fungus isolated from asymptomatic, surface-sterilized leaf tissue was *A. tenuissima* (87%). Eight isolates were selected for pathogenicity tests using wounded/unwounded leaves. Scanning-electron microscopy observations revealed *A. tenuissima* spores germinating on the surface and only entering through stomata of unwounded, inoculated leaves. Unwounded, inoculated leaves had no symptoms and light microscopy observations revealed hyphae in mesophyll tissue growing intercellularly with no cell penetration. Seven of the 8 isolates produced brown, circular, necrotic lesions only at the wound site of wounded and inoculated leaves. These tissues were collapsed and colonized. Results suggest that *A. tenuissima* can act as a latent leaf pathogen with an endophytic phase.

Nematode pathogenicity to sugarcane cultivars in Louisiana: Microplot conditions. J. P. BOND (1), E. C. McGawley (1), J. W. Hoy (1), and W. P. Bond (2). (1) Department of Plant Pathology and Crop Physiology, Louisiana State University Agricultural Center, Baton Rouge, LA 70803; (2) Department of Biological Sciences, Southeastern Louisiana University, Hammond, LA 70402. Phytopathology 89:S8. Publication no. P-1999-0050-AMA.

Populations of *Tylenchorhynchus* spp., *Mesocriconema* spp., and *Trichodorus* spp. occur commonly in Louisiana sugarcane soils and increase in density with successive ratoon crops. Three microplot experiments evaluated the damage potential of this community to cultivars that are commonly planted. Two sugarcane cultivars: CP70-321 or LCP82-089 and three nematode infestation levels: 0, 1,200, or 12,000 nematodes per microplot (approximately equal portions of each species) were arranged in a randomized complete block with a 2 × 3 factorial treatment structure. Across both cultivars, top weight was reduced at the highest infestation level. Root and plant dry weight were reduced at both infestation levels. Across all treatments, plant dry weight for LCP82-089 was less than that of CP70-321. Final nematode populations at both infestation levels did not differ for all three nematode species. For each species, nematode reproduction was greatest at the low infestation level.

Use of acidic electrolyzed water to obtain axenic cultures of *Tilletia indica* from wheat or soil samples. M. R. BONDE (1), S. E. Nester (1), J. L. Smilanick (2), R. D. Frederick (1), N. W. Schaad (1), and D. G. Luster (1). (1) USDA–ARS, FDWSRU, Ft. Detrick, MD 21702-5023; (2) USDA–ARS, Fresno, CA 93727. Phytopathology 89:S8. Publication no. P-1999-0051-AMA.

Acidic electrolyzed water (AEW), a product of electrolysis (Super Oxseed Labo JED 020; Advanced H_20, Alameda, CA) of a dilute solution of NaCl, was very effective for treating wheat or soil wash extracts to obtain axenic cultures of *T. indica*. When debris was extracted from 15 separate 50-g wheat samples by means of size-selective sieving (Peterson et al., Phytopathology 88:S131), treated 20 min with AEW, and plated on water agar plus antibiotics (AW agar), an average of three non-smut fungal colonies grew per sample. Of 210 AW agar plates seeded with soil extract obtained by sucrose-centrifugation (Babadoost et al., Plant Dis. 82:1357–1361), only 7% supported microbial growth other than *T. indica*. Contaminants on AW agar seeded with non-treated wheat or soil extracts were too numerous to count. Besides eliminating most non-smut organisms, a 15- to 30-min AEW treatment typically at least doubled *T. indica* teliospore germination at 7 days after plating.

Fruit, blossom and foliar epiphytic populations of strawberry on the California coast. A. C. BORDAS (1), S. T. Koike (2), W. D. Gubler (1), and C. T. Bull (3). (1) UC Davis, Dept. of Plant Pathology; (2) UC Coop. Extension, Salinas, CA; (3) USDA–ARS, Salinas, CA. Phytopathology 89:S8. Publication no. P-1999-0052-AMA.

We have conducted preliminary studies to identify common microbial residents of aerial surfaces of strawberry. Microbial populations of strawberry plants were sampled during the 1997 and 1998 growing seasons. Bacteria and fungi were isolated from plants sampled at two locations, Watsonville and Salinas, CA. The cultivars sampled were Seascape and Selva in 1997 and 1998, respectively. The plant tissues sampled were fully expanded leaves, mature red fruit, and fully opened blossoms. Isolations of bacteria were made on half strength nutrient agar, isolations of fungal populations were made on PDA amended with tetracycline. Bacteria were identified by whole cell fatty acid analysis using the Microbial Identification System (MIS) software package (MIDI, Inc., Newark, DE) with an aerobe library. Fungi were identified using morphological characteristics. Bacteria identified from fruit surfaces include isolates of *Pseudomonas, Bacillus, Pantoea,* and *Yersinia.* Fungi identified from fruit surfaces include isolates of *Botrytis, Sporobolomyces, Cladosporium, Aspergillus,* and *Penicillium* spp. For both years, greater populations of bacteria and fungi were found on fruit than on blossoms or leaves at both locations.

Evaluation of compost for biological control of dollar spot (*Sclerotinia homoeocarpa*) on creeping bentgrass (*Agrostis palustris*). J. I. BOULTER, G. J. Boland, and J. T. Trevors. University of Guelph, Guelph, ON N1G 2W1, Canada. Phytopathology 89:S8. Publication no. P-1999-0053-AMA.

The influence of high quality, reproducible composts on turfgrass health is being investigated. In this study, five compost mixtures (All Treat Farms, Ltd., Arthur, ON) were evaluated for suppression of dollar spot (*Sclerotinia homoeocarpa*) of creeping bentgrass (*Agrostis palustris*). Field plots inoculated with *S. homoeocarpa* were topdressed with compost in single or multiple (every 3 weeks) applications from July to October 1998, and disease severity was rated weekly. In most assessments, multiple applications of compost significantly ($P = 0.05$) suppressed dollar spot severity in comparison to untreated controls or the single application treatments, and were not significantly different from disease severity in plots treated with a fungicide standard (chlorothalonil). There were no significant differences among the five compost mixtures in their ability to control dollar spot. The results indicate that applications of quality composts every three weeks can suppress dollar spot in creeping bentgrass at levels comparable to a fungicide and contribute to reduced fungicide use.

Effect of botanical extracts on populations of *Phytophthora nicotianae* and disease control in the greenhouse. J. H. BOWERS and J. C. Locke. USDA–ARS, U.S. National Arboretum, Floral and Nursery Plant Research Unit, Beltsville, MD 20705. Phytopathology 89:S8. Publication no. P-1999-0054-AMA.

Botanical extracts are being investigated for control of diseases caused by *Phytophthora.* Soil infested with chlamydospores of *Phytophthora nicotianae* (P.n.) was treated with 1, 5, and 10% aqueous emulsions of formulated extracts of clove (70% clove oil), neem (90% neem oil), pepper (chili pepper and essential oil of mustard), cassia (cassia tree extract), and metalaxyl. Population densities of P.n. were determined at 0 (before treatment), 1, 3, 7, 14, and 21 days after treatment. Treatment of the soil with 5 and 10% aqueous emulsions resulted in significant ($P < 0.05$) differences among treatment mean values at each assay date. After 3 days, the clove and cassia extracts added as 10% aqueous emulsions reduced the population density of P.n. 99.6 and 99.2%, respectively, while the pepper formulation reduced the P.n. population to below the limit of detection (<0.4 cfu/cm^3). In the greenhouse after 35 days, 10% aqueous emulsions of the pepper and cassia extracts suppressed disease development in periwinkle (90–100% healthy plant stand) compared to the untreated infested soil (<5% stand).

Interaction of glyphosate with microbial biocontrol agents for Canada thistle. S. M. BOYETCHKO, K. L. Bailey, W. Hall, K. Sawchyn, T. Nelson, and J. Derby. Agriculture and Agri-Food Canada, Saskatoon, SK. Phytopathology 89:S8. Publication no. P-1999-0055-AMA.

Application of sub-lethal rates of glyphosate with *Pseudomonas syringae* pv. *tagetis* (Pst) and *Alternaria* sp. (93-109B1) to enhance their efficacy for biocontrol of Canada thistle was investigated. Pst causes apical chlorosis while *Alternaria* produces extensive foliar necrosis. In greenhouse studies, disease severity and reductions in biomass were significantly greater when Pst was applied with 0.1× recommended rate of glyphosate, followed by Pst alone or Pst with 0.01× glyphosate. Sub-lethal rates of glyphosate alone caused no disease or biomass reductions. Application of 1.0× and 0.1× glyphosate with *Alternaria* killed more thistle (49% and 21%) than glyphosate alone (32% and 4%). No synergistic effects between glyphosate and *Alternaria* were observed in field studies.

A technique for evaluating adult plant resistance of sugar beet germ plasm to *Aphanomyces cochlioides*. J. R. BRANTNER and C. E. Windels. University of Minnesota, Northwest Exp. Stn., Crookston, MN 56716. Phytopathology 89:S8. Publication no. P-1999-0056-AMA.

A technique is needed to reliably evaluate resistance of sugar beet germ plasm of older (≥ 6-wk-old) plants to infection by *A. cochlioides*. Six-wk-old sugar beet plants were grown in 15-cm diam pots and inoculated with 0, 10^4,