Disease Notes

White Pine Blister Rust on Limber Pine in South Dakota.

J. E. Lundquist and B. W. Geils, USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO 80526; and D. W. Johnson, USDA Forest Service, Lakewood, CO 80225. Plant Dis. 76:538, 1992. Accepted for publication 13 November 1991.

White pine blister rust, caused by *Cronartium ribicola* J. C. Fisch., here reported for the first time from South Dakota, was found on limber pine (*Pinus flexilis* E. James) and wax currant (*Ribes cereum* Douglas) in a 2.5-ha stand at Cathedral Spires in the Black Hills National Forest. The infested stand is the easternmost natural extension of limber pine and is isolated from the nearest limber pine stand by 160 km and the nearest known population of *C. ribicola* by 240 km. Diseased pines bore dying branches with fusiform swellings and ruptured bark associated with aecia. Aeciospores matched previous descriptions of *C. ribicola* when stained with lactophenol and cotton blue and viewed under a microscope. Aecia or uredina were found on about 10% of the host trees or shrubs, respectively. Voucher specimens have been deposited in the Forest Service Forest Pathology Herbarium, Fort Collins, Colorado (No. 6805-C).

First Report of *Ascochyta rabiei* on Berseem Clover Seeds.

F. Montorsi, G. Di Giambattista, and A. Porta-Puglia, Istituto Sperimentale per la Patologia Vegetale, Via Bertero 22, 00156 Rome, Italy. Plant Dis. 76:538, 1992. Accepted for publication 26 October 1991.

In 1989, seed samples of berseem clover (*Trifolium alexandrinum* L.), provided by P. Martiniello, were tested on water-soaked blotters (100 seeds per sample) to assess either infected or infested seeds for mycoflora. *Ascochyta rabiei* (Pass.) Labrousse (2), the causal agent of Ascochyta blight of chickpea (*Cicer arietinum* L.), was isolated from two seeds of one sample from Foggia in southern Italy. Pathogenicity tests were carried out by spraying a conidial suspension (1.5×10^6 conidia per milliliter from a single hyphal-tip isolate) on potted plants of berseem clover (Italian land race, 30 days old) and chickpea (cv. Calia, 15 days old) until runoff. The inoculated and uninoculated plants of both species were covered with transparent polyethylene bags for the first 48 hr after inoculation to increase RH and kept in a greenhouse (20 ± 3 C). Symptoms appeared after 10–12 days. On chickpea, typical leaf and stem lesions were observed. On berseem clover, small, elongated flesh-colored spots with brown rims appeared on leaves. The fungus was reisolated from both hosts. Uninoculated control plants were symptomless. These findings agree with those of Kaiser (1) and confirm the role of hosts other than chickpea in the epidemiology of *A. rabiei*. On berseem clover, distribution and effect of *A. rabiei* in the field, its localization in the seed, and its means of dispersal should be investigated further.

References: (1) W. J. Kaiser. Phytopathology 80:889, 1990. (2) I. C. Kovachevski. Rev. Appl. Mycol. 15:700, 1936.

Barley Stripe Rust in Texas.

A. P. Roelfs and J. Huerta-Espino, USDA-ARS, Cereal Rust Laboratory, Department of Plant Pathology, University of Minnesota, St. Paul, MN 55108, and D. Marshall, Texas A&M University, 17360 Coit Road, Dallas 75252. Plant Dis. 76:538, 1992. Accepted for publication 18 November 1991.

On 18 April 1991, a severe case of stripe rust was found on barley (*Hordeum vulgare* L.) in an irrigated nursery at Uvalde, Texas. Stripe rust, caused by *Puccinia striiformis* Westend., has occurred on wheat in Texas, but no wheat cultivars in the nursery were infected, although many are susceptible to the pathogen. Urediniospores from the infected barley were tested on wheat and barley stripe rust differential sets. Isolates were avirulent on the wheat set, including cvs. Michigan Amber and Lemhi, but virulent to cvs. Fong Tien, Larker, Morex, Robust, Steptoe, and Topper in the barley set and avirulent to BBA 809, Bigo, Emir, Hiproly, I5, Mazurka, Sakigake, and Varunda; responses in cvs. Astrix and Cambrinus were intermediate. This pathogen probably spread from Mexico, where stripe rust has been severe on barley in recent years. It may be similar to the barley stripe rust pathogen introduced into South America in 1975 that later spread across most of that continent (1). To become important in the United States, the pathogen would need a winter host (fall-seeded barley) and a late summer and fall host, perhaps volunteer barley and/or the wild *Hordeum* species.

Reference: (1) H. J. Dubin and R. W. Stubbs. Plant Dis. 70:141, 1986.

First Report of *Sclerotium rolfsii* Infection of *Poa annua* in Illinois.

R. T. Kane and H. T. Wilkinson, Department of Plant Pathology, University of Illinois, Urbana 61801. Plant Dis. 76:538, 1992. Accepted for publication 15 January 1992.

A spreading foliar disease of *Poa annua* L. was noticed on northern Illinois golf course putting greens during August 1988 and 1991. Both years were notably hotter and drier than normal. Rapidly growing mycelia were found in the canopy and in thatch of advancing margins of circular rings 15–25 cm in diameter. Individual plants wilted and turned yellow. Most plants recovered as colonization expanded, although some necrotic rings were later observed on greens. Bentgrass plants in the sward were affected less severely. Standard techniques were used to isolate *Sclerotium rolfsii* Sacc. directly as aerial mycelium and from diseased leaf tissue. Brown sclerotia and clamp connections were observed only in vitro in 7-day-old cultures. Identification of the pathogen was confirmed by L. L. Burpee (University of Georgia). *S. rolfsii* causes a serious disease of *P. annua* in California (1). This is the first report of southern blight of *P. annua* in Illinois.

Reference: (1) Z. K. Punja and R. G. Grogan. Plant Dis. 67:875, 1983.

Molecular Characterization of Tomato Yellow Leaf Curl Virus from Egypt.

M. K. Nakhla, M. R. Rojas, W. McLaughlin, J. Wyman, and D. P. Maxwell, University of Wisconsin, Madison 53706, and H. M. Mazyad, Agricultural Research Center, Giza, Egypt. Plant Dis. 76:538, 1992. Accepted for publication 2 January 1992.

Tomato yellow leaf curl virus (TYLCV) causes major yield losses of tomatoes in Egypt. A TYLCV isolate (EG1) collected from the Fayoum governorate in 1984 was transmitted experimentally to tomato (*Lycopersicon esculentum* Mill.) by *Bemisia tabaci* (Gennadius) and to *Nicotiana benthamiana* L. by grafting. Geminivirus particles were observed in preparations from TYLCV-infected tomato. A 1.3-kb fragment of TYLCV-EG1 from infected *N. benthamiana* was amplified in a polymerase chain reaction using general geminiviral primers (*unpublished*) that anneal to either AL1 or AR1 (1). The partial sequence of the clone (pTYREG1) is: GATTACGTTG TACCACGCAT CAGTACTGTA CACCTTTGGG CTTAGGTCTA GATGTCCACA TAAATAATTA AGTGGGCCTA GAGACCTGGC CCACATTGTT TTGCCTGTTC TGCTATCACC CTCAATGACA ATACTTATGG GTCTCCATGG CCGCGCAGCA GAAGACACGA CGTTCTCGGC GACCCACTCT TCAAGTTCAT CTGGAACTTG ATTAAAAGAA GAAGAAAGAA ATGGAGA. Nucleotide sequence comparisons of AL1 with the same region of TYLCV from Israel (1), African cassava mosaic geminivirus, tomato golden mosaic geminivirus, and bean golden mosaic geminivirus-GA showed identities of 96, 81, 65, and 65%, respectively. On the basis of nucleotide sequence comparison for part of the Common Region, TYLCV-EG1 was not closely related (<50% identity) to TYLCV from Thailand (2). TYLCV-infected and healthy tomatoes from Egypt could be differentiated by means of radiolabeled pTYAEG1 in nucleic acid squash hybridization tests under high stringency conditions. This is the first report that TYLCV from Egypt is a geminivirus and that it is nearly identical to TYLCV from Israel (1).

References: (1) N. Navot et al. Virology 185:151, 1991. (2) D. Rochester et al. Virology 178:520, 1990.

First Report of Natural Infection of *Arabidopsis thaliana* by *Xanthomonas campestris* pv. *campestris*. J. Tsuji and S. C. Somerville, MSU-DOE Plant Research Laboratory, Michigan State University, East Lansing 48824-1312. Plant Dis. 76:539, 1992. Accepted for publication 13 November 1992.

Semioval necrotic and chlorotic lesions were observed on the margins of leaves of the cruciferous weed *Arabidopsis thaliana* (L.) Heynh. growing along a roadside in Kalamazoo, Michigan. A gram-negative, rod-shaped bacterium was isolated from diseased tissue and identified as *Xanthomonas campestris* pv. *campestris* (Pammel) Dowson by the following criteria: yellow mucoid colonies on YDC, growth on SX, xanthomonadin pigment production, growth at 35 C, protease activity, and ability to cause black rot disease on turnip (*Brassica campestris* L. subsp. *campestris*) from Bentley Seed Co. (Cambridge, NY). To fulfill Koch's postulates, we sprayed guttating leaves of 3-wk-old *A. thaliana* race Pr0 with the bacterium. Symptoms identical to those described above were observed 1–2 wk after inoculation, and the same bacterium was reisolated from the diseased leaves. No blackened veins were observed on either naturally infected or artificially inoculated leaves. This is the first report of natural infection of *A. thaliana* by *X. c. campestris* and further extends the range of cruciferous weeds that are alternative hosts for this bacterium.

First Report of Downy Mildew of Sunflower in Greece. C. C. Thanassoulopoulos and C. B. Mappas, Aristotelian University, Faculty of Agriculture, Plant Pathology Laboratory, 540 06 Thessaloniki, Greece. Plant Dis. 76:539, 1992. Accepted for publication 26 October 1991.

Sunflower (*Helianthus annuus* L.) cultivation in Greece is limited to northeastern Thrace, mainly in Rodopa Prefecture. During a survey in June 1991, more than 50% of plants in a 0.4-ha field of a local cultivar were found to have symptoms typical of downy mildew. Healthy plants had seven to nine true leaves and were 1–1.2 m tall, whereas diseased plants were dwarfed (a few centimeters to 70 cm tall), with thicker than normal leaves that curled downward and showed extensive epiphyllous mottling. Downy growth of the fungus covered the abaxial surface of symptomatic leaves and also appeared on the adaxial surface of some leaves. The fungus showed monopodial branching of conidiophores at nearly right angles, with five or six terminal branches 6–9 μm long and bearing single elliptic, papillate zoosporangia, 15–25 $\times$ 12–17 μm. Sporangiophores were 260–450 μm. The fungus was identified as *Plasmopara halstedii* (Farl.) Berl. & De Toni in Sacc. The disease has long occurred in the neighboring countries of Yugoslavia, Bulgaria, and Turkey, but this is the first report in Greece. Weather conditions were favorable for disease development in 1991, with continuous rain during the sunflower seeding period in North Greece.

Occurrence of *Cercosporidium punctum* on Fennel in California. S. T. Koike, University of California Cooperative Extension, Salinas 93901; E. E. Butler, Department of Plant Pathology, University of California, Davis 95616; and A. S. Greathead, Salinas, CA 93908. Plant Dis. 76:539, 1992. Accepted for publication 11 February 1992.

In August 1991, commercial plantings of fennel (*Foeniculum vulgare* Mill.) in Monterey County, California, were affected by a new disease. Symptoms consisted of withering and drying up of older foliage. Affected leaf tips and stems turned brown. The stems and threadlike leaves were extensively covered with discrete brown pustules that became white when the fungus sporulated. Microscopic examination showed that the pustules consisted of erumpent fascicles of conidiophores and conidia. The conidiophores were brown, unbranched, geniculate, dark at the conidial attachment scars, and mostly aseptate above the basal septum. The conidia were hyaline, smooth, cylindric, and usually one septate and measured 28–51 (av. 34–45) $\times$ 6–9 μm. The fungus was identified as *Cercosporidium punctum* (Lacr.) Deighton (1). Pathogenicity was tested by spraying a conidial suspension (3 $\times$ 10^5 conidia per milliliter) onto 15 2-mo-old plants in a greenhouse; four control plants were sprayed with distilled water. After 21 days the erumpent fascicles of *C. punctum* were observed on all of the test plants; foliage later withered. None of the control plants showed symptoms. Although *C. punctum* has been reported on fennel from France, Italy, Ethiopia, India, Jamaica, and the Canary Islands (1), this is the first report on this host from the United States. This fennel pathogen has also been observed in Santa Barbara and Santa Cruz counties. Voucher specimens have been deposited at the University of California herbarium at Berkeley.

Reference: (1) F. C. Deighton. Mycol. Pap. 112:1, 1967.

First Reports of Sclerotium (Southern) Blight and Rhizoctonia Aerial Blight of Soybeans in Kansas. J. A. Appel, Plant Health Division, Kansas State Board of Agriculture and Department of Plant Pathology, Kansas State University, Manhattan, and D. J. Jardine, Department of Plant Pathology, Kansas State University, Manhattan 66506-5502. Plant Dis. 76:539, 1992. Accepted for publication 2 November 1991.

Soybean (*Glycine max* (L.) Merr.) plants with characteristic symptoms and signs of southern blight caused by *Sclerotium rolfsii* Sacc. were found in two of 15 fields in August 1990 in the southeastern Kansas counties of Labette and Cherokee. Incidence of affected plants was 10–50% in localized areas. The fungus formed sclerotia after 13 days in culture and on inoculated soybeans in pots. The fields had a history of soybean or grain sorghum; soil moisture was surplus at planting but fell to low levels during the season. Also in August 1990, soybean plants were received at the Kansas State University Plant Disease Clinic from the northeastern county of Doniphan with leaves that appeared water-soaked or were brown to reddish brown. Lesions varied from 1 cm in diameter to covering the entire leaf and were present on the petioles and stem. Biopsies of diseased tissue on potato-dextrose agar produced colonies of *Rhizoctonia solani* Kühn. Frequent rains during late July and August in Doniphan County resulted in adequate to surplus soil moisture and high relative humidity levels.

First Report of *Botrytis cinerea* on Kenaf in Spain. A. De Cal and P. Melgarejo, Departamento Protección Vegetal, CIT-INIA, Madrid, Spain. Plant Dis. 76:539, 1992. Accepted for publication 4 December 1991.

Kenaf (*Hibiscus cannabinus* L.) is intended to be introduced in Spain as an alternative to crops with surplus production. During September–October of 1990 and 1991, several experimental fields of kenaf in northern Spain and in the Canary Islands were affected by gray mold caused by *Botrytis cinerea* Pers.:Fr. Shoots of infected plants showed necrotic areas, and some lesions completely encircled the stem; parts above this area died, and lodging occurred. The mycelia and gray conidia of the fungus were apparent on lesions. Hyaline, one-celled conidia and conidiophores conformed to those described as *B. cinerea*. The fungus was isolated consistently from diseased tissues onto potato-dextrose agar (PDA). Pathogenicity was proved by application of *B. cinerea* as 7-day-old mycelial plugs with or without PDA directly to the shoot and by application of a piece of PDA culture of the fungus to a small incision made in the shoot. Five 116-day-old greenhouse-grown plants were tested three times by each inoculation method. Symptoms obtained with all inoculations developed after 5 days and were identical to those observed in natural field infections. The fungus was readily reisolated on PDA from artificially inoculated kenaf. This is the first report of *B. cinerea* on kenaf in Spain and in Europe. Infected kenaf had to be harvested 1 mo before the optimal date, with consequent losses in yield and quality of the fiber. Gray mold may potentially affect kenaf seed production in the Canary Islands.

Salute to APS Sustaining Associates

This section is designed to help APS members understand more about APS Sustaining Associates. Information is supplied by company representatives. Each month features different companies. A complete listing appears in each issue of *Phytopathology*.

Agdia, Inc. Contact: Chester L. Sutula, 30380 County Road 6, Elkhart, IN 46514; 219/264-2014, fax: 219/264-2153. Agdia, Inc., was founded in 1981 to develop and manufacture plant pathogen diagnostics using immunoassay and probe-based technology. Agdia now offers over 150 plant pathogen detection products. Its pathogen tests are now used in more than 70 countries.

Agriculture Canada. Contact: Sheridan Alder, Librarian, Research Station, Box 6000, Vineland Station, Ontario, Canada L0R 2E0; 416/562-4113. The Agriculture Canada Vineland Research Station, one of more than 40 research establishments of the Research Branch of Agriculture Canada, was built in 1967 and was formed from amalgamating the Dominion Entomological Laboratory at Vineland and the Plant Pathology Laboratory in St. Catharines. A comprehensive program of crop protection research serving the horticultural industry is carried out at the Vineland Research Station. A multidisciplinary approach applies entomology, toxicology, acarology, nematology, virology, mycology, computing science, and residue chemistry expertise to the pest and disease problems of various horticultural crops. Pest and disease management programs at the station include research on tree fruits, vegetables, grapes, glasshouse ornamentals, small fruits, and woody ornamentals. The diversification of plant protection research supports a wide range of horticultural industry problems.

Agri-Diagnostics Associates. Contact: Burl Sealls, Marketing Director, Moorestown West Corporate Center, 1 Executive Drive, Suite 10, Moorestown, NJ 08057; 609/727-4858. Agri-Diagnostics is dedicated to improving the management of agronomic practices through diagnostic products that provide reliable, rapid, and economical detection of plant pathogens, chemicals, and plant components.

Agrigenetics Company. Contact: Jim Perkins, Manager, Applied Plant Pathology, 5649 E. Buckeye Road, Madison, WI 53716; 608/221-5000. Agrigenetics Company, a business unit of the Lubrizol Corporation, is a diversified seed and genetic engineering research company that seeks to commercialize the results of plant breeding and biotechnology in crop agriculture. The research program uses new genetic biotechnologies, including cell and tissue culture in recombinant DNA technology, as well as traditional plant breeding techniques. Agrigenetics operates a specialty vegetable oil company, a genetic mapping company for plants and animals, eight separate North American seed companies, and an international division, with markets in more than 50 countries.

Alf Christianson Seed Co. Contact: Philip Brown, P.O. Box 98, Milwaukee Road, Mt. Vernon, WA 98273; 206/336-9727; fax: 206/336-3191; telex: 4945728 ALF UI. Alf Christianson, founded in the late 1920s by the grandfather of the present principals, Ken Christianson, president, and David Christianson, vice-president, grows vegetable seeds for the wholesale seed trade worldwide. Production is largely divided between the maritime counties of Puget Sound and the Columbia River Basin of Washington State. The principal seed crops are beet, cabbage, carrot, collards, herbs, kale, mustard, radish, rutabaga, spinach, Swiss chard, and turnip. Alf Christianson is a member of the American Seed Trade Association, the Federation of International Seedsmen, and a number of state and local seed trade organizations.

American Cyanamid Company. Contact: James D. Froyd, Agricultural Research Center, P.O. Box 400, Princeton, NJ 08543-0400; 609/799-0400. American Cyanamid is a global, high-technology, research-based company founded in 1907. It currently ranks among the 100 largest industrial firms in the United States. Annual sales exceed $3.5 billion from agricultural, medical, chemical, and consumer product lines. The Agricultural Group serves crop and livestock producers and public health programs worldwide with technologically advanced, environmentally acceptable herbicides, insecticides, animal nutrition and health products, and fertilizers. Cyanamid has introduced the first in a series of new chemical herbicides, the imidazolinones, which represent an entirely new class of chemistry.