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Bob Hunger.

Wheat diseases in Oklahoma in 2008.

Until the month of May, 2008 was a fairly quiet year for diseases in Oklahoma. Prior to May, powdery mildew, leaf rust, stripe rust, septoria, tan spot, wheat streak mosaic, high plains, and barley yellow dwarf were all confirmed in the state. However, at the end of the first week of May, leaf rust exploded across central and north-central Oklahoma, and hot spots of stripe rust were observed. As May progressed, other diseases observed included dryland root rot, stem rust, and Fusarium head blight. Leaf rust did not hit the southern, northwestern, or panhandle regions of Oklahoma because of drought; however, in the central and north-central regions of Oklahoma, fungicide use was much greater than normal due to severe leaf rust.

Breeding for wheat disease resistance.

Regional nurseries, including the Southern Regional Performance Nursery, the Northern Regional Performance Nursery, and the Regional Germplasm Observation Nursery, were tested for reaction to wheat soilborne mosaic/wheat spindle streak mosaic in the field, and to leaf rust in the greenhouse (seedling) and field. Results from these and other trials conducted on winter wheat are summarized at <http://www.ars.usda.gov/Research/docs.htm?docid=11932>.

Tan spot research.

Three isolates of *P. tritici-repentis* were compared for hyphal growth, sporulation, reproduction, and virulence on wheat. These isolates, OKD-1, RBB6 and OK06-1, were collected in Oklahoma in 1983, 1996, and 2006, respectively. Greatest radial growth was observed for OK06-1, which also produced significantly ($P < 0.05$) more conidia. Isolates were similar in number of pseudothecia formed; OK06-1 produced the highest percent of mature pseudothecia (22.0%), followed by OKD-1 and RBB6. RBB6 produced significantly less conidia than OKD-1 but was more virulent in the field. Maximum disease severity was recorded for OK06-1 in both greenhouse and field studies. In the field, OK06-1 reduced yield by 20.7% compared to the control, whereas RBB6 and OKD-1 reduced yield by 13.8 and 4.9%, respectively. Similar testing with additional isolates currently is ongoing.

Karnal bunt testing.

Commercial wheat produced in Oklahoma in 2008 was examined for the presence of teliospores of *Tilletia indica*. Testing was conducted using methods and following protocols approved by the Animal and Plant Health Inspection Service (APHIS). In 2008, 52 samples collected from elevators representing 14 counties were tested, which satisfied APHIS's National Karnal Bunt Testing Program. Testing has been conducted every year since 1996 in Oklahoma, with no positive samples being found.

Personnel.

Faculty conducting research in wheat pathology has been greatly reduced in the past 5 years because of retirements in 2004 by Mr. Ken Jackson, Dr. Larry Singleton, and Dr. Larry Littlefield. Bob Hunger's efforts are now primarily directed toward screening wheat breeder lines for disease reaction, incorporating disease resistance into wheat germ plasm, and fulfilling the extension wheat pathology responsibilities including foliar fungicide and seed treatment testing on wheat. He also advises two Ph.D. students, Mr. Kazi Kader (Bangladesh), who is comparing isolates of the tan spot pathogen collected over the last 25 years, and Mr. Ahmed Abd-Elmajid (Egypt – Dr. Hassan Melouk, co-advisor), who is investigating the effect of water potential on diseases of peanut and wheat.

Publications.

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2008 wheat production in the Commonwealth of Virginia.

W.E. Thomason, C.A. Griffey, and J.E. Seago

Growing Conditions. The autumn of 2007 presented challenging planting conditions for many growers due to dry soil conditions with over half the state reported to be very short of soil moisture. Growers needing to perform primary tillage waited for rain, whereas some small grain was planted into these dry seedbeds. Rains in late October improved conditions dramatically and by the end of the first week of November, wheat planting reached 53 percent of intended