

## WHEAT DISEASE NOTES 2007-2008

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### 1. WHEAT DISEASE INCIDENCE ON 2006-2007 GROWING SEASON.

Drier than expected environmental conditions, during the 06-07 growing season rendered an overall decrease in disease incidence. *Puccinia recondita* (leaf rust) was present in low amounts. *Blumeria graminis* f. sp. *tritici* (powdery mildew) incidence was moderate but weather conditions and early spray of fungicides helped to avoid an epidemic. Dry conditions impacted other diseases appearance. *Fusarium* spp. (causal agent of fusarium foot rot) and *Gaumannomyces graminis* var. *tritici* (take-all) were found in central and southern Georgia and may have contributed to the early decline of some fields. *Stagonospora* (Glume blotch on heads and leaves) incidence was low during the season. However, an increase on calls to specialists and samples submitted to the Plant disease clinic were observed in localized areas on diseases such as loose smut caused by *Ustilago tritici*, and black point caused by *Alternaria* spp. Loose smut incidences can be attributed to untreated seed plantings. Barley Yellow Dwarf Virus (BYDV) was variable throughout the state, with low amounts observed in South Georgia. From the Piedmont and north, the damage was moderate. Sporadic samples with soilborne wheat mosaic virus symptoms were observed last season.

Disease dynamics observed during the past growing season can provide important information on possible disease scenarios and to implement scouting activities on a timely manner during this growing season. More educated decisions on disease prevention and management can be made.

### 2. DISEASE IDENTIFICATION AND MANAGEMENT FOR THE 2007-2008 SEASON

Disease data for all the recommended varieties for Georgia are found in the current 2007 Georgia Wheat Production Guide or Georgia Small Grain Variety Performance Test Bulletin. As indicated in an earlier UGA wheat

management update, seed supply was extremely short in 2007. There were many varieties currently offered for sale in Georgia that are better adapted for the mid-south (Missouri, Arkansas, Tennessee, etc) and they may have variable disease response compared to those adapted to Georgia. Therefore is imperative to remain vigilant and contact your local county Extension office at the first sign of disease. Begin scouting fields when the plant reaches GS 32-37 (Feekes GS 7-8). In general, powdery mildew and stripe rust will likely appear first. If no disease is present by GS 58 (Feekes 10.5) but expected, due to conducive environmental conditions, then apply the proper rate of Quilt®, Stratego®, Headline® or Quadris® to maintain the high yield potential and test weight. See the Georgia Pest Control Handbook or Wheat Production Guide for rate and timing information. Remember fungicides do not increase yield. They only help you to preserve the yield and test weight.

### 3. DISEASES OF WHEAT UNDER WARM, LOW RAINFALL ENVIRONMENTAL CONDITIONS

#### DRYLAND FOOT ROT

This disease is also called Fusarium foot and root rot, common foot rot, brown root rot, and crown rot.

#### Cause

*Fusarium graminearum* and *F. culmorum* are most common *Fusarium* species associated with water-stressed wheat. These two species can survive in the soil and wheat debris as thick-walled, asexual resistant spores called chlamydospores

#### Symptoms and Signs

Fusarium cause the root, crown and lower nodes and internodes of wheat plants to turn brown and rotted and a purplish discoloration of the stem is

readily observed. Foot rot tends to be most severe on ridges and slopes where soils are drier. Plants that are severely diseased mature early produce mostly shriveled seed, appear bronzed, bleached or/and have whiteheads. In the early stages of disease development and under the right conditions, a pinkish discoloration may appear inside the leaf sheaths.

#### Disease

#### Cycle

The fungi responsible for dryland foot rot are ubiquitous. They are good saprophytes in tissues they previously parasitized, and can multiply rapidly on infested wheat residues. Chlamydo spores may persist in soil for months. Primary infections occur on coleoptiles, subcrown internodes and primary and secondary roots. Drought and warm temperatures predispose wheat to dryland foot rot. Plants stressed by freezing or Hessian flies are also subject to attack. The disease can be severe in wheat receiving too much fertilizer for the amount of rainfall available, especially in areas receiving less than 16-18 inches per year.

#### Control

Seedling infections are reduced by using clean or chemically disinfected seed. Also, late-autumn seeding is recommended to decrease seedling exposure to warm soil temperatures. Reduced seedling infection, is not guarantee against infection at later stages. Establish nitrogen application rates on soil tests for residual nitrogen, and avoid excessive use of nitrogen fertilizer. Clean cultivation discourages development of grass weeds and speeds breakdown of infested crop residues. Crop rotation is advised to limit alternative hosts. This practice help limit the buildup of pathogen populations in the soil.



#### References

Wiese, M. V. 1987. Compendium of Wheat Diseases. APS Press.

Maloy, O. C., and Inglis, D. A. 1993. Dryland foot rot. <http://pnw-ag.wsu.edu/smallgrains/Dryland%20Foot%20Rot.html>

#### 4. WHEAT DISEASE REVIEW

If favorable environmental conditions are present (irrigated wheat or rainfall event, combined with proper temperatures), leaf rust can be problematic early in the season.

#### Leaf Rust - *Puccinia recondita* f. sp. *tritici*

#### Disease

#### Symptoms:

Small pustules about one-sixteenth inch in diameter with flaky red spores develop rapidly on leaves. Pustules may be found early in the growing season on lower leaves, but they usually appear in large numbers on the upper leaves after flowering.

#### Signs:

Pustules with red, flaky spores break the leaf surface. The urediospores are round to slightly oval, slightly rough, and easily dislodged.

#### Conditions

#### Favoring

#### Disease:

Leaf rust is favored by temperatures from 60 to 80F. Because infection occurs quickly, brief showers or overnight dew are sufficient for infection to begin.

#### Disease

#### Management:

Leaf rust is best controlled by planting resistant cultivars. Because the disease develops quickly and new races can develop frequently, it is important to know the susceptibility of a cultivar (see annual CAES Small Grains Performance Tests Research Report or the Wheat Production Guide). Plant several resistant cultivars to reduce the risk of severe disease. Control volunteer wheat which can become infected in late summer and serve as a local source of spores. Avoid early planting to reduce fall infection. Foliar-applied fungicides are very effective for use on susceptible cultivars (see [GA Pest Control](#))

[Handbook](#)). Apply fungicide when the uppermost leaf has emerged for best control.



**2. Barley Yellow Dwarf Virus.** Warmer temperatures can initiate aphid activity earlier in the season, therefore increasing the potential for Barley Yellow Dwarf Virus incidence. Barley yellow dwarf virus (BYDV) is probably the most widely distributed virus in wheat. It is estimated to reduce yields by 5 to 25% each year. The symptoms are variable and resemble nutritional problems or frost damage. Usually the discoloration is characterized by various shades of yellow or reddening from the tips to the base and from the leaf margin to the midribs of the leaves. Some varieties have more yellow symptoms whereas others have more red to purple discoloration. When infection begins early in the season, after heading the uppermost leaf is often very upright. Severe infection usually causes some stunting and reduction in numbers of seeds per head. BYDV is transmitted by several aphid species. Aphids acquire the virus by feeding on infected plants for very short periods and then move to other uninfected plants. Infection can occur any time when viruliferous aphids multiply and migrate in fields. Crop rotation is less effective for barley yellow dwarf because aphids can transmit the virus between fields, and many grasses on which the

aphids feed also harbor the virus.

Barley yellow dwarf can cause severe losses in many Georgia fields, most often following a mild fall and winter which allows aphids to be active and transmit the virus early in plant development. BYDV is present in nearly all fields each year. Disease severity depends on aphid populations and the proportion of aphids that can transmit the virus. Control of volunteer wheat and grassy weeds during the summer and along the edges of fields may slow initial infection. Planting during the latter part of the recommended period can delay fall infection. Resistant varieties and insecticide application to control aphids can reduce damage from barley yellow dwarf (see Insect Management).

## 5. WHEAT DISEASE RESOURCES

For more information on wheat disease identification and management resources you can use or visit

1. Field Crops Disease Library at <http://plantpath.caes.uga.edu/extension/DiseaseLibrary.html#field>
2. Buntin, G. D., and Cunfer, B. 2000. Southern Small Grains Resource Management Handbook. UGA Bulletin 1190
3. 2007-208 Wheat Production Guide. Lee, D. et al 2007. CSS-05-10 September 2007.