OSU OKLAHOMA COOPERATIVE EXTENSION SERVICE

WHEAT PRODUCTION NEWSLETTER

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Stripe Rust Found in Oklahoma!

Dr. Bob Hunger, Extension Wheat Plant Pathologist

On March 22nd, I visited variety trials and fields in central Oklahoma near Apache (about 25 miles north of Lawton), and in southwestern Oklahoma near Frederick, Tipton and Altus. For a more detailed version of this update including photographs and disease descriptions, go to the Entomology and Plant Pathology Disease and Insect Advisory. This electronic publication is available within 1-2 days after the distribution of the shortened version and can be found at: http://www.entoplp.okstate.edu/Pddladvisory.htm

At nearly all of the stops I made, I saw aphids (greenbugs or bird cherry-oat aphids), signs of aphid feeding, aphid predators, and spots of what I believe was barley yellow dwarf virus. Additionally, I saw **leaf rust pustules on lower leaves in most of the fields or plots**. More specifically, at:

Apache, OK:

- I saw very little evidence of wheat soilborne mosaic or wheat spindle streak mosaic, where these two diseases have typically been observed in the past.

- There was moderate to severe powdery mildew in the trials and fields. I was in several fields of Jagalene that were severely mildewed, with the mildew completely covering the lower stems and leaves. Upper leaves were chlorotic and had sporulating mildew pustules. This wheat did not yet have the flag leaf emerging, but after the losses attributed last year due to mildew, these fields are likely candidates to be sprayed this year.

- In a field of 2174 I found pustules of wheat stripe rust on the lowest leaves. These leaves were quite yellow but still alive, and appeared to be harboring pustules containing viable spores.

Wheat Leaf Rust

Southwestern OK:

- One field that Aaron Henson (Tillman County Extension Educator) took me to was **severely infected with septoria**. The wheat was earlier than stage 8, with the top of the canopy appearing from the road to be frost-burned. However, instead of frost the cause was septoria.

- Another field I visited with Aaron in Tillman County was **heavily infested with tan spot**. This was a no-till field, and the residue was covered with the fruiting bodies (pseudothecia) of the tan spot fungus.

- A field of Tomahawk wheat that was just approaching growth stage 8 was **heavily infested with stripe rust**. Again, the top of the canopy appeared frost-burned, but examination revealed this discoloration was due to stripe rust.

- Many plots in trials at the Altus station were moderately infected with stripe rust and/or leaf rust, and as stated above, I saw either aphids or evidence of aphid feeding as well as predators (lady beetle larvae or lady beetles).

Tan Spot

Updates from other states:

- **TEXAS – Monday, March 21**:

Dr. Jackie Rudd, Associate Professor, Wheat Breeding, Texas A&M Agricultural Research Center

I just returned from looking at wheat nurseries across Texas. I found leaf rust and stripe rust in every nursery I looked at. Severities ranged from a trace in the Panhandle to severe in south Texas and some locations in northcentral. The relative severity of leaf rust versus stripe rust differed from location to location. Powdery mildew was at moderate levels in some "extra lush" locations, but severities were much less than what we saw last year. Winter wheat is jointing in most locations and the early varieties will start to head this week in south Texas. Yield potential is generally good across the state. I have heard of several reports of fungicide applications, but I don't really know how prevalent this has been. None of the currently popular varieties are resistant to the prevalent leaf rust races. The stripe rust resistance in Jagger, Jagelene, Cutter, and TAM 111 is still effective.

- **NEBRASKA - Tue, 22 Mar 2005:**

John E. Watkins, University of Nebraska

It looks like leaf rust overwintered in southern Nebraska as we have had some reports of orange pustules present on the lower more protected leaves. This is in an area that has a significant leaf rust outbreak last fall and because of good fall moisture and a long fall some of the wheat in that area put on alot of growth before winter. We did have some below zero periods last winter but those occurred when the wheat had good snow cover so those lower leaves stayed green all winter. –

Q & A for Foliar Fungicide Use in Oklahoma

Dr. Bob Hunger, Extension Wheat Pathologist and Dr. Jeff Edwards Extension Wheat Agronomist

Question: How is wheat growth described?
Answer: The Feekes' scale. This scale, which is named after the person that developed it, describes the stages of wheat with a numerical scale. This is the most commonly used descriptor in recommendations for pesticide applications.

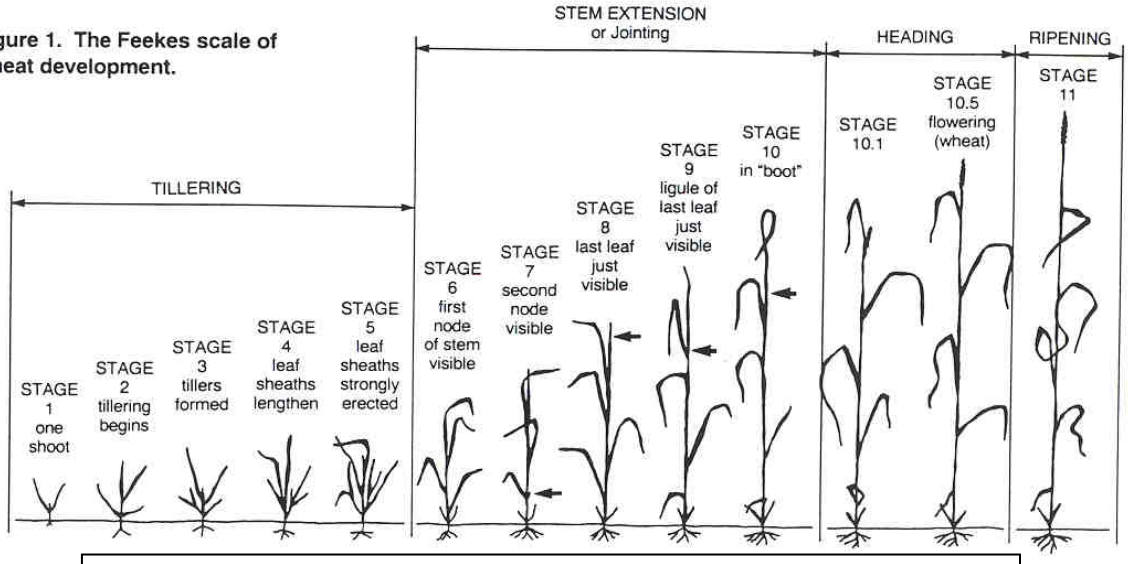

Figure 1. The Feekes scale of wheat development.

Large, E.C. 1954. Growth stages in cereals: Illustration of the Feekes' scale. Plant Pathology 3:128-129.

Question: *How much damage can a foliar disease such as leaf rust cause on wheat?*

Answer: *A foliar disease such as leaf rust generally causes the most damage when high severities occur at early growth stages such as heading, flowering or milk (see Table 1).*

Table 1. Approximate percent loss of yield caused by leaf rust at combinations of leaf rust severity and growth stage of wheat.

	Severity (%) of leaf rust on the flag leaf				
Growth stage	**10**	**25**	**40**	**65**	**100**
Flowering	10	15	20	30	35
Milk	2	5	8	14	20
Soft dough	1	3	4	7	10
Hard dough	**1**	**1**	**1**	**3**	**5**

Question: When should I apply a fungicide?
Answer: All the fungicides listed in Tables 2 & 3 can be applied up to growth stage 10.5, which is when heads are completely emerged. However, applying a fungicide at 10.5 usually is later than needed in order to receive the maximum benefit from the fungicide. In most years, the optimum period for application is between growth stages 9 (flag leaf fully emerged) to 10 (full boot). Application at this time will provide protection during the critical times of flowering and milk (Table 1).

Table 2. Effect of Foliar Fungicides on Grain Yield and Test Weight

STILLWATER - 2004:	Growth stage•	Yield (bu/A)	Test wt. (lb/bu)	Leaf rust severity	Powdery mildew severity
No treatment	-----	75.1	56.8	50.0	15.0
Stratego 250 EC (10 fl oz)	9	86.8*	57.3	20.0*	6.5
Stratego 250 EC (10 fl oz)	10.2	83.2*	58.0*	17.5*	10.0
Quilt 200 SE (14 fl oz)	9	86.6*	57.2	17.5*	7.5
Quilt 200 SE (14 fl oz)	10.2	87.5*	57.3	4.0*	15.0
Headline 250 F (6.1 fl oz)	9	86.8*	57.3	15.0*	7.5
Headline 250 F (6.1 fl oz)	10.2	82.8*	57.7	6.5*	12.5
LSD (P=0.05)		5.6	1.1	8.1	8.8

STILLWATER – 2002:	Growth stage•	Yield (bu/A)	Test wt. (lb/bu)	Leaf rust severity	Septoria complex severity
No treatment	-----	58	52.5	75.0	21.3
Tilt 3.6 EC	8	68*	53.7	48.8*	6.5*
Tilt 3.6 EC	10	68*	53.5	25.0*	8.7*
Quadris 2.08 F	9	75*	54.4	5.5*	1.8*
Stratego 250 EC	8	72*	53.1	46.3*	7.5*
Stratego 250 EC	10	70*	54.3	22.5*	4.0*
Headline 2.09 EC (6.1 fl oz)	9	78*	55.0	8.0*	3.0*
LSD (P=0.05)		***8***	***NS***	***7.5***	***5.0***

•GS8=flag leaf just visible; 9=flag leaf emerged; 10=boot; 10.2=¼ of ear emerged.
*=indicates significant difference from the mean value for the "no treatment."

Question: What fungicides are available for use in Oklahoma?
Answer: Currently there are four fungicides most commonly mentioned in relation to controlling foliar wheat diseases. These include Tilt and Quilt (Syngenta), Stratego (Bayer Crop Science), and Headline (BASF). A brief comparison of these fungicides is presented in Table 3. Please realize that costs of fungicides are estimates **REMEMBER** to consult the label for the most current and accurate information.

Table 3. Fungicide cost and efficacy for control of foliar wheat diseases.

[**This information is provided only as a guide. It is the responsibility of the pesticide applicator by law to read and follow all current label directions. No endorsement is intended for products listed, nor is criticism meant for products not listed**].

Product & (Company)	Fungicide type	Rate/acre (fl oz)	PHI[A] (days)	Approx cost/oz[B]	Approx cost/A[B]	Leaf rust	Stripe rust[C]	Powdery mildew	Septoria complex	Tan spot
Tilt..... (Syngenta)	triazole	4.0	40	2.88	11.52	G[D]	VG	E	VG	G
Quilt ..... (Syngenta)	strobilurin + triazole	14.0	45	0.98	13.72	VG	VG	E	VG	VG
Stratego ..... (Bayer)	strobilurin + triazole	10.0	35	1.27	12.70	VG	VG	E	VG	G
Headline ..... (BASF)	strobilurin	6.1-9.0	14[A] (hay)	2.03	12.38-18.27	E	E	G	VG	VG

[A]PHI = pre-harvest interval, that is the number of days required between last application & grain harvest (or in the case of Headline, hay harvest).
[B]Etimated chemical cost as of March, 2005. Prices do not include application charges and may vary with time, dealer, rebate offers, etc.
[C]Efficacy ratings for stripe rust control based on information obtained in 2004 from the North Central Regional Committee on Management of Small Grains Diseases
[D]=excellent; VG=very good; G=good; F=fair; P=poor.

Question: What is the potential benefit from using a foliar fungicide?
Answer: More than 20 years of fungicide trials including years with little or no disease and several years with high disease pressure have documented an average yield increase of approximately10% from using fungicides. Such an increase justifies fungicide use if the yield potential and price of wheat are high. Hence, consider the following to assist in deciding whether to apply a fungicide to control a foliar disease:

- What is the yield potential of the wheat? This should be 40-50 bu/acre at a minimum, but can go up or down depending on the price of wheat.
- What is the price of wheat? $3.00-3.50/bu or more is desirable.
- What is the growth stage of the wheat? Foliar diseases do the most harm when infection severities are high at stages such as heading, flowering and milk.
- What disease is present? Be sure it is a foliar fungal disease.
- What is the disease reaction of the variety? Refer to the O.S.U. Variety Characteristic Chart by selecting "Variety Info" on the web site at:http://www.wit.okstate.edu/varietyinfo/index.html. Some pathogens (e.g., the pathogen that causes wheat leaf rust) can adapt to resistance genes, and hence, a resistant variety may become susceptible when a new race appears.
- What is the weather forecast? Hot and dry conditions inhibit further disease development and hasten ripening, while cool and moist conditions promote disease and lengthen the period of time for grain development and filling.

►The above considerations can be used to help determine the potential value of a fungicide application, that is, a simple cost-benefit evaluation. For example:

Grain production at $3.50/bu:

10%	X	50 bu/A	X	$3.50/bu	–	$16.00/A	=	$1.50/A
Potential increase		Estimated yield goal		Estimated selling price		Fungicide + application cost		Potential profit

Seed production (e.g. certified seed) at $8.00/bu:

10%	X	50 bu/A	X	$8.00/bu	–	$16.00/A	=	$24.00/A
Potential increase		Estimated yield goal		Estimated selling price		Fungicide + application cost		Potential profit

Upcoming events

April 18, 2005: Grower meeting at Caddo-Kiowa Tech. Center in Ft. Cobb. Contact the Caddo County extension office for details.

Wheat Field Days

April 27 – Menko – 10:00 AM

May 4 – Elk City – 9:00 AM

May 5 – El Reno (Banner Rd. and I-40) – 10:30 AM

May 6 – Frederick – Time T.B.A.
- Apache – 5:00 P.M.

May 9 – Alva – 6:00 PM

May 17 – Woodward – 8:00 AM

May 20, 2005 – Lahoma field day, Lahoma Research Station – Time T.B.A.

Contact county extension offices for directions and agendas not listed.

We are in the process of posting variety signs at our trial locations. Variety trial plot plans can be downloaded at **http://www.pss.okstate.edu/wheat/index.htm**

Subscription information

The *Wheat Production Newsletter* is published in electronic format on an as needed basis throughout the year. To receive an electronic copy in pdf format, send an email with **subscribe** as the subject line to jeff.edwards@okstate.edu

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