

# WHEAT PRODUCTION NEWSLETTER



Oklahoma State University Small Grains Extension  
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## Is there a fungus among us?

By Jeff Edwards and Bob Hunger

Good moisture, good temperatures, and good prices are all helping Oklahoma wheat farmers get by these days. Given these better-than-average conditions, many Oklahoma wheat producers are considering the application of a foliar fungicide. So, we will devote much of this issue of the WPN to the topic of foliar fungicides.

The cardinal rule regarding foliar fungicides is that ***they protect the yield potential you already have.*** In other words, a foliar fungicide application will not make a 40 bushel crop into a 60 bushel crop, but it will prevent a 60 bushel crop from being reduced to 40 bushel by foliar disease.

Next, you should consider the disease package of the varieties you are growing. Varieties with good disease packages, such as Overley and OK Bullet will not respond to fungicide application as well as susceptible varieties like AP502CL and 2174.

Two references that are useful in gauging the probable response of a wheat variety to fungicide application are a current ***wheat variety comparison chart*** and ***variety trial results*** from Apache and Lahoma (both of these locations had fungicide vs. no fungicide comparisons last year). These documents can be found at <http://www.wheat.okstate.edu/vtr/index.htm>

Finally there are the issues of which product to use and when to spray. Both of these issues are covered in Q&A discussion on the next few pages. The take home message is whichever product you choose, apply it early enough to protect the flag leaf. Once you see disease on the flag leaf, damage has already occurred and you have missed your optimum window. Whether or not we have a particularly bad year for foliar disease is yet to be seen; however, by the time we have this information it will be too late to protect your crop.

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Powdery mildew is generally not a problem unless it infects the flag leaf



Leaf rust appears more frequently in OK than stripe rust, but is less aggressive.



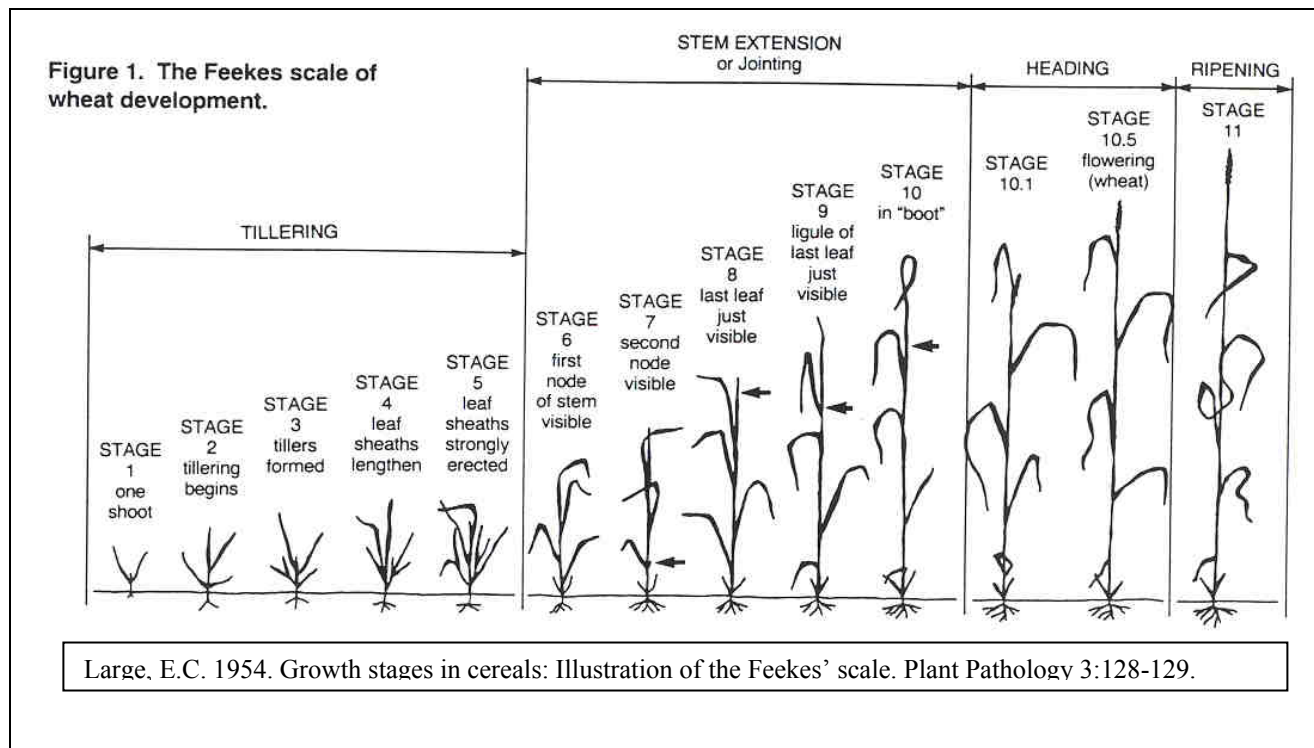
Stripe rust is not a problem every year in OK, but it is very aggressive and can severely reduce yield potential when it occurs

## Q & A Regarding Foliar Fungicides

By Jeff Edwards and Bob Hunger

**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.



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

**Answer:** A foliar disease such as leaf rust causes the most damage when high severities occur at early growth stages such as heading, flowering or milk (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				
	10	25	40	65	100
<b>Growth stage</b>	-----% yield loss-----				
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, with the exception of Propimax, 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 desired 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) because application in this range of growth stages will provide protection during the critical times of flowering and milk (Table 1).

<b>Table 2. Effect of foliar fungicides on grain yield and test weight</b>					
	Growth Stage <sup>†</sup>	Yield bu/ac	Test weight lb/bu	Leaf rust ----% severity----	Powdery mildew
<b>Stillwater 2005</b>					
No treatment	-	68	57	90	18
Tilt 3.6 EC @ 4 oz	9	69	57	<b>64<sup>‡</sup></b>	<b>6</b>
	10.5	72	57	<b>35</b>	15
Stratego 250 EC @ 10 oz	9	76	58	<b>33</b>	<b>3</b>
	10.5	<b>78</b>	58	<b>5</b>	13
Quilt 200 SE @ 14 oz	9	76	57	<b>13</b>	<b>1</b>
	10.5	<b>79</b>	57	<b>5</b>	<b>10</b>
	LSD (P=0.05)	9	NS <sup>§</sup>	20	7
<b>Perkins 2005</b>					
No treatment	-	48	56	2	15
Tilt 3.6 EC @ 4 oz	9	48	56	<b>0</b>	<b>4</b>
	10.5	49	56	<b>0</b>	10
Stratego 250 EC @ 10 oz	9	53	56	<b>0</b>	10
	10.5	49	56	<b>0</b>	10
Quilt 200 SE @ 14 oz	9	54	57	<b>0</b>	<b>7</b>
	10.5	52	56	<b>0</b>	10
	LSD (P=0.05)	NS	NS	0.1	7
<b>Stillwater 2004</b>					
No treatment	-	75	57	50	15
Stratego 250 EC @ 10 oz	9	<b>87</b>	57	<b>20</b>	7
	10.5	<b>83</b>	<b>58</b>	<b>18</b>	10
Quilt 200 SE @ 14 oz	9	<b>87</b>	57	<b>18</b>	8
	10.5	<b>88</b>	57	<b>4</b>	15
Headline 250 F @ 6.1 oz	9	<b>87</b>	57	<b>15</b>	8
	10.5	<b>83</b>	<b>58</b>	<b>7</b>	13
	LSD (P=0.05)	6	1	8	NS
<sup>†</sup> Growth stage 9 = flag leaf fully emerged; growth stage 10.5 = heads fully emerged <sup>‡</sup> treatments statistically different from the nontreated check are highlighted in bold type <sup>§</sup> NS = nonsignificant					

**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 approximately 10% 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:

- **Will a foliar fungicide help to regain yield?** The answer to this is “NO!” Foliar fungicides can only help to protect the yield potential present at application.
- **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. Stripe rust can be especially damaging because of its ability to kill entire leaves. Hence, if you are considering a spray application to protect against stripe rust, the window of application is less than it is for leaf rust.
- **What is the disease reaction of the variety?** Refer to the OSU 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

Potential increase	Estimated yield goal	Estimated selling price	Fungicide + app. cost	Potential return on investment
<b>Grain production scenario</b>				
10%	30 bu/A	\$4.50/bu	\$16.00/A	(\$2.50/A)
10%	50 bu/A	\$4.50/bu	\$16.00/A	\$6.50/A
<b>Same scenario for certified seed production</b>				
10%	30 bu/A	\$9.00/bu	\$16.00/A	\$11.00/A
10%	50 bu/A	\$9.00/bu	\$16.00/A	\$29.00/A

**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 Propiconazole [marketed under the trade names of Tilt (Syngenta) and PropiMax (Dow AgroSciences)], Quilt (Syngenta), Stratego (Bayer Crop Science), and Headline (BASF). A comparison of these fungicides is presented in Table 3.

**REMEMBER** to consult the label for the most current and accurate information.

Table 3. Fungicide efficacy for control of foliar wheat diseases <sup>†</sup>									
Fungicide type	Product	Company	Rate	PHI <sup>‡</sup>	Leaf rust	Stripe rust <sup>§</sup>	Powdery mildew	Septoria complex	Tan Spot
			fl oz/A	days					
Triazole	Tilt	Syngenta	4	40	G <sup>¶</sup>	VG	E	VG	G
	Propimax	Dow Agrosciences	4	40	G	VG	E	VG	G
Strobilurin	Headline	BASF	6 - 9	14	E	E	G	VG	VG
Stobilurin + triazole	Quilt	Syngenta	14	45	VG	VG	E	G	VG
	Stratego	Bayer	10	35	VG	VG	E	VG	G
<sup>†</sup> Information provided only as a guide and no endorsement is intended for products listed, nor is criticism meant for products not listed. Always read and follow label directions! <sup>‡</sup> PHI = pre-harvest interval for grain harvest or in the case of Headline, hay harvest <sup>§</sup> Efficacy ratings for stripe rust control based on information obtained in 2004 from the North Central Regional Committee on Management of Small Grains Diseases <sup>¶</sup> E = Excellent; VG = Very Good; G = Good; P = poor									

## Check fields for Russian Wheat Aphids

By Tom A. Royer, Extension Entomologist

I have received very scattered reports of Russian wheat aphid (RWA) infestations in western Oklahoma, particularly the Oklahoma Panhandle. It has been a long time since Oklahoma producers have experienced noticeable Russian wheat aphid infestations, so I would like to provide a “primer” for making control decisions just in case the problem becomes more widespread.

First, some cautions: just because a field has RWA does not mean that the field must be treated; instead, it means that it should be closely evaluated to determine if treatment is needed.

A second caution: just because the planted variety is resistant to RWA does not mean the field doesn't need to be scouted. “Biotype 2” forms have been found in Oklahoma, which can attack resistant varieties such as “Halt” “Stanton” and “Prairie Red” AND they have a much faster growth rate, allowing them to build in numbers more rapidly as temperatures warm.

**Biology:** Russian wheat aphids reproduce by giving live birth to female young. Their “daughters” are already carrying developing “granddaughters” inside their bodies. They can become adults within a very short period of time, so that populations can increase rapidly. Each adult can produce five or six nymphs per day. They will remain in the wheat, and will feed on developing heads as the wheat matures. They can also give rise to winged adults that can fly away and start new colonies.



**Description of Insect:** Russian wheat aphids are small, lime-green aphids with a “football shaped” body. The legs and antenna are short, and they do not have cornicles (those tail pipe protrusions). They do have structure at the tip of their abdomen that looks like a double tail.



**Symptoms of Damage:** Wheat that is attacked by RWA will have rolled leaves and later, the emerging heads will become trapped. The rolled leaves will often have purple and white longitudinal streaks. If a rolled leaf is unrolled, you will probably see the aphids inside feeding.



**Control:** The decision to treat for RWA should be made by careful scouting of the field. Use the following formula to determine the need to treat:

Treatment Threshold (percent of infested tillers) =

$$(\text{Control cost}/\$ \text{Acre} \text{-----} \times 200) \div (\text{Expected Yield} \text{-----} \text{bu} \times \text{Market Value } \$/\text{bu} \text{-----})$$

Example: Control cost = \$8.00, Expected yield = 40 bu, Market value = \$ 4.00/bu

$$\text{Treatment threshold} = 8 \times 200 = 1600 \div 40 \text{ bu} \times 4 = 160$$

$$\text{Treatment threshold} = 1600 \div 160 = 10\% \text{ tillers infested.}$$

There are several products registered for control or Russian wheat aphid, including beta cyfluthrin (Baythroid XL), chlorpyrifos (Lorsban 4E and numerous other products), dimethoate, gamma cyhalothrin (Proaxis), lambda cyhalothrin (Warrior and numerous other products), methyl parathion, and zeta cypermethrin (Mustang Max). Read the label, and follow all directions and restrictions.

Mention of a product is for identification purposes only and is not intended as an endorsement.

### 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](mailto:jeff.edwards@okstate.edu)

### Upcoming Events

**May 3** - Canadian county wheat field day. Location and time TBA.

**May 18** - Wheat field day at the North Central Research Station in Lahoma, OK.