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This year's wheat crop across the Panhandle is in excellent condition. With any help from May rains the crop should be the best in years. Insect and virus diseases have thus far been minimal. We are seeing more fungal diseases, due largely to the wet weather, than that we normally see. These include septoria, powdery mildew, leaf rust, and stripe rust. The most serious of these diseases are the rusts. The wet weather this last weekend, along with the potential for more rain this week, could potentially cause an explosion in the incidence of wheat rust in many Panhandle fields. Below is an update on management options to consider. These management considerations were taken primarily from recent papers written by Drs. Calvin Trostle, Harold Kaufman, Gaylon Morgan, Donald Reid, James Swart, and Bob Hunger (OSU). These papers can be found at the following web site and should be examined for further information:
<http://amarillo.tamu.edu/programs/agronomy/publications/Wheat/index.htm>.

Stripe Rust and Leaf Rust

Stripe rust is a relatively new rust for the Panhandle showing up in a few fields three years ago. It has become the dominant rust in our area. Stripe rust looks very similar to leaf rust, except the rust pustules tend to line up between the leaf veins giving it a striped appearance. Stripe rust will thrive in 46° to 58° degrees when moisture is present on the leaves. The moisture can come from heavy morning dews, rainfall, or sprinkler irrigation. In contrast, leaf rust prefers a little warmer conditions and will thrive in 70° temperatures.

Variety Resistance

It is thought that there are still some differences in varieties in tolerance to leaf and stripe rust. However, data collected in south Texas strongly suggests that all varieties are now susceptible. It is possible that the rust strains we have in the Panhandle still lend themselves to some degree of varietal resistance. Recent observations made by Dr. Calvin Trostle in Lubbock and others suggests some leaf rust resistance of Cutter and Jagalene varieties.

Questions to Consider in Dealing with Rust in Wheat

The following was modified from a paper written by Drs. Calvin Trostle and Harold Kaufman:

What is my yield potential and what is the expected price of grain at harvest?

Oklahoma research suggests that in order to justify the cost of fungicides that a minimum per acre yield of 40 bushels (and possibly 50 bu/A) and price at least \$3.00-3.50/bu is necessary to justify spraying. This has to do with the cost of the fungicide application and the expected level of protection. A fungicide application will likely cost about \$16.50/acre. Spraying fungicide will not increase your yields rather it preserves your yield potential.

How important is a healthy flag leaf for wheat grain yield potential? And what level of infestation warrants spraying?

Some research shows that the flag leaf contributes as much as 75% or more of grain yield. So keeping it healthy is of utmost importance for realizing grain yield potential. Both the Morgan and Oklahoma documents (see website) have a table demonstrating approximate percent leaf rust infection covering the flag leaf beginning at flowering and the expected subsequent yield loss.

For example, a wheat crop at flowering with 40% of the flag leaf covered with leaf rust has an estimated yield loss of 20%.

What fungicide products are used for leaf and stripe rust?

There are primarily two fungicides (active ingredients) that can be used for leaf and stripe rust control. These are sold under five trade names either as a single active ingredient or a combination of the two. These products are triazole (Tilt, Propimax), strobilurin (Headline, Quadris), or both (Stratego, Quilt). Literature suggests that products with strobilurin may have better control but also cost more.

Results of a trial conducted last year near Commerce, TX showed little difference in the effectiveness of the various fungicides on stripe rust when evaluated 28 days after application made at the flag leaf stage.

Evaluation of foliar fungicides for the control of stripe rust in soft red winter wheat near Commerce, TX, 2004 (Reid and Swart).

Treatments (Formulated Rate/A)	% Flag Leaf	
	Infected, 28 DAT	Yield, bu/Ac
Folicur 3.6 FL @ 6 oz.	0.0a	96.3a
Folicur 3.6 FL @ 4 oz.	0.0a	95.0a
Tilt 3.6 EC @ 4 oz.	0.2a	94.3a
Quilt @ 14 oz.	0.3a	94.3a
Stratego 2.08 EC @ 10 oz.	0.6a	93.8a
Quadris 2.08 FL @ 6.2 oz.	0.8a	93.0a
Quilt @ 10.5 oz.	2.0a	92.7a
Stratego 2.08 EC @ 8 oz.	4.2ab	92.0a
Headline 2.09 EC @ 9 oz.	8.3b	91.9a
Headline 2.09 EC @ 6 oz.	8.7b	91.7a
Untreated Check	85.8c	68.2b

What stage of growth is usually most important for fungicide sprays to control leaf rust?

The growth stages that warrant consideration for spraying to protect yield potential are from flag leaf fully emerged (Feekes growth stage 9.0) to flowering to full boot to milk. Sprays at soft dough and hard dough don't offer much control because they are late. Spraying from the stage of flag leaves fully emerged to full boot is best, but this probably applies more to when leaf rust is developing vs. already infesting a field and the lower leaves on the wheat plant.

If leaf rust is already strongly present would fungicide sprays best be applied sooner than all flag leaves fully emerged?

If leaf rust is already strongly present then earlier spraying is probably warranted, provided that yield potential criteria, etc. are met. If leaf rust is already strongly present then waiting until (all) flag leaves are fully emerged risks infection of leaf rust on the flag leaf—and fungicides work best at prevention rather than curing an existing problem.

Keep in mind that the amount of leaf rust infection moving to the flag leaf from lower leaves will be reduced when conditions are dry and warm to hot. Anticipating weather favorable to rust development on the flag leaf is the most important factor.

Overall, keep in mind that leaf rust does the most damage when infection is high during heading, flowering, milk stage, but foliar fungicides after the fact have less value.

If I have to spray earlier to control leaf rust will my window of effective control run out? Would I possibly have to spray again if I sprayed early in the presence of high leaf rust?

We believe the window of effective control is at least 14 days and an additional level of control may be available up to 21 days. Even if a field that is severely infected has a high yield potential (>70-80 bu/A?) it is doubtful that a second spray would be justified. One option is to spray a half rate of fungicide on early and apply a second half rate application two weeks later. This should give you longer overall protection.

Remember as you progress through the season and rust encounters drier conditions and more heat, the spread of infection slows down.

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