Stripe Rust in South-Central Texas

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Stripe rust (*Puccinia striiformis*) recently has been reported in wheat fields in south and central Texas. With a probable wet winter and spring in store due to the prevailing climatic condition known as *el nino*, stripe rust could become a serious problem this year. During favorable weather for this disease, stripe rust can rapidly damage leaf area with the potential to significantly reduce yields and test weights. The presence of stripe rust in south and central Texas indicates that inoculum is present. If current cool, damp weather conditions prevail, the disease will likely spread north into central and north Texas, as was the case in 2001 and 2002.

Stripe rust can be distinguished from the two other wheat rusts that occur in Texas, leaf rust and stem rust. Stripe rust pustules form between the leaf veins as long streaks and are yellow as compared with the small circular, orange, pustules of leaf rust or the short, rectangular, brick red pustules of stem rust.

Comparing the Wheat Rusts

Rust type	Pustule Color & Size	Pustule Shape	Location of Pustules
Leaf	Orange, 1.5 mm	Round	Scattered on leaf blades
Stem	Brick red, 3 x 10 mm	Rectangular	Stems, sheaths and neck; seldom on leaf blades
Stripe	Yellow, 0.5 mm x Long stripe	Elongated stripe	Leaves, glumes

Mild, humid winters, cool springs and abundant humidity favor stripe rust development and spread. Stripe rust is usually not as prevalent in Texas as leaf rust, perhaps because stripe rust development often becomes hindered with the increasing temperatures that often occur as the Texas wheat crop advances. The optimum temperatures for disease development are lower for stripe rust than for either leaf rust or stem rust. As night temperatures exceed about 65^{o} F, stripe rust infections become less aggressive and the disease progress often is reduced.

The systemic foliar fungicides Quadris, Tilt and Stratego can be used to protect high-yield wheat from stripe and leaf rust when applied properly. Field tests have shown that all three fungicides are effective against stripe rust when applied properly. Tilt and Stratego have a Section 24 (c) special local needs registration for late-season use on wheat in Texas for protection against rust. These special registrations permit

application on wheat as late as Feekes Growth Stage 10.5 (full head emergence, pre-bloom), but not any later. Tilt is labeled at 4.0 fl. oz./ acre and Stratego at 10.0 fl. oz./ acre. Quadris is also labeled for application up until Feekes Stage 10.5 at 6.2 to 10.8 fl. oz./ acre. Other considerations that should be made in deciding to use a fungicide or not include:

1. The crop must have at least a yield potential of 40 bushels per acre or more. It is unlikely that the yield protection offered by these fungicides will exceed 25%, thus the 40-bu/ac figure is recommended to ensure economic returns to applications. As yield potential increases above 40 bushels, so does the potential return from fungicide application.
2. Cool temperatures, high humidity, cloudy conditions, heavy dews, and good soil moisture favor rust development.
3. Apply the fungicide between Feekes Stage 8 (last leaf visible but rolled; head in boot beginning to swell) until Feekes Stage 10.5 (full head emergence, but before bloom). In Texas, often applications timed toward the later part of this "application window" are more effective, if disease conditions permit waiting.
4. Two applications are permitted on the label for Quadris and Stratego, but the economics of two applications is questionable in most situations. Approximate costs of the fungicides, not including application costs are:
    a. Tilt @ 4.0 fl. oz./ac --- $10.30/ac
    b. Stratego @ 10 fl. oz./ac --- $12.90/ac
    c. Quadris @ 6.2 – 10.8 fl. oz./ac --- $13.60 - $23.60/ac.

5. Consider cultivar relative susceptibility to stripe rust. Some cultivars are less susceptible than others. Jagger and lines with Jagger parentage have had good resistance in hard red winter wheats. AgriPro's Mason and Pioneer brand 25R57 have shown acceptable field resistance in soft red winter wheats. There are many races of the rusts, and cultivar disease reaction can change as rust populations change.

2000 – 2001 Rust Reactions --- Soft Red Winter Wheat --- North Texas Blacklands

Source	Variety	Stripe Rust	Leaf Rust
AgriPro	Mason	R - MR	R
Pioneer	2571	MS	MR-MS
Pioneer	2684	S	MR-MS
Pioneer	2566	MS	S-MS
Syngenta	Coker 9663	MS-S	MR
U. Arkansas	Jaypee	S	MR-MS
Pioneer	2568	MS	R
Pioneer	25R57	MR-R	MS-MR
Syngenta	Coker 9704	S	R
LSU	LA 422	MS	R
AgriPro	Natchez	MR	R
VPI	Roane	MS	R

AgriPro	Shelby	MR	R

1999-2001 Rust Reactions --- Hard Red Winter Wheat --- North Texas Blacklands

Source	Variety	Stripe Rust	Leaf Rust
Texas A&M	TAM 302	MS	MS-MR
Public	2180	MS-S	MS-S
AgriPro	Ogallala	MR-MS	MS-MR
Kansas St.	Jagger	R	S
Texas A&M	TAM 301	MR	S
Texas A&M	TAM 202	MS	MS
AgriPro	Coronado	MS-S	MR-MS
Texas A&M	TAM 400	S	MR

Resistance to the rusts noted by: R = resistance, MR = moderate resistance, MS = moderately susceptible, S = susceptible.

Dr. Travis Miller has shown that a topdress application of a chlorine-bearing fertilizer applied at or before jointing, can significantly reduce damage due to rust where chlorine deficiency is present. Other researchers also report similar results.