Rust Update May 24, 2013

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Stripe rust in the Pacific Northwest

The large-scale and good amount participations from last week to yesterday in eastern Washington, eastern Oregon, and northern Idaho have stopped the drought conditions and will bring millions of dollars to wheat and barley growers. Growers may wonder if the good moisture conditions will boost stripe rust.

Based on our disease surveys in Adams and Whitman counties on June 13; Walla Walla, Columbia, Garfield, Asotin, and Whitman counties of Washington and Nez Perce and Latah Counties of Idaho yesterday; and reports from colleagues and growers in Idaho, Oregon, and Washington, both stripe rusts of wheat and barley are generally at very low levels (less than 0.5% incidence and less than 5% severity) in winter and spring wheat and spring barley fields with stripe rust observed. About 50% of the checked fields had no rust. The low level of stripe rust in commercial fields was due to the widespread of early used fungicides together with herbicide application which has greatly reduced rust inoculum, resistant varieties, and the dry weather conditions from late April to last week. Few fields have had a second application of fungicides.

In contrast, in our experiment fields, stripe rust has developed to over 90% severity on susceptible winter wheat and up to 40% severity on susceptible spring wheat entries at Walla Walla, Lind (irrigated), and Pullman locations under natural infection. The development of stripe rust in the nurseries has been slower than normal due to the dry weather conditions up to last week. Under the normal weather conditions in eastern Washington, it usually takes a month from observation of first small rust pustule to over 90% severity on susceptible varieties. This year, it has taken about two months for stripe rust to develop up to 90% severity from the first appearance.

Although stripe rust inoculum is still low, wheat crops may have been infected during the last several days as the moisture and temperature ranges have been very favorable for stripe rust infection. The infected plants will likely to have rust showing up in the next several days depending upon variety resistance, crop stage and the temperature conditions. The relatively hot weather conditions forecasted from this weekend to the next 10 days may not be favorable for new infections, but may not be high enough for stopping rust growth from infected leaves or heads.

These days are the last critical time for stripe rust control of this crop season, especially for spring wheat. Whether an immediate fungicide application is needed or not depends upon the above mentioned factors.

Variety resistance. Because the warm-hot weather forecasted for the next 10 days and likely in the entire July, high-temperature adult-plant resistance will work well. Resistant and moderately

resistant varieties do not need fungicide application. Susceptible and moderately susceptible varieties may need immediate fungicide application if the previous application was more than three weeks ago. We have not seen obvious race changes this year so far, and therefore, expect varieties to have similar reactions as in last year. Please check variety stripe rust data in our website (http://striperust.wsu.edu/diseaseManagement/cultivar-resistance-yield-loss-data-stripe-rust.html; http://striperust.wsu.edu/nurseryData/puccinia-striiformis-nursery-data-2012.html) and/or Seed Buyer's Guide for resistance or susceptible levels of your varieties.

Crop stages. Winter wheat crop currently ranges from flowering (Feeks 10.3) to soft dough (passed 10.5), and spring wheat ranges from late jointing (Feeks 8) to flowering (Feeks 10.5). If the crop reaches soft dough stage, do not apply fungicides as stripe rust will not cause significant damage and most fungicides are labeled for use only up to flowering stage. If the crop has passed flowering stage but still have more than a moth to harvest, only Tebucanozole (like Folicur) can be used.

Temperatures. Stripe rust infection and sporulation are affected mostly by temperatures, although moisture is essential for infection. When night temperature does not drop below 65^{o}F, stripe rust will stop. You may use 60-65^{o}F of minimum daily temperature in the next couple of weeks as a guideline for your area. If minimum daily temperatures constantly above 60-65^{o}F, you may not need to apply fungicides even for susceptible and moderately susceptible varieties.

The current stripe rust population easily produces telia, black-colored rust pustules with teliospores unable to infect cereals. When telia are produced, stripe rust will stop developing and reproducing urediniopores, yellow-orange spores that are able to infect cereal crops.

Stripe rust in other states

Nationwide, wheat stripe rust have been reported at various levels in Arkansas, Texas, Louisiana, Mississippi, California, Oregon, Oklahoma, Georgia, Kansas, Tennessee, South Carolina, Kentucky, Nebraska, Alabama, Illinois, Delaware, Virginia, Indiana, Missouri, Wisconsin, Michigan, North Carolina, New York, Vermont, and South Dakota, making this year another most distribution of stripe rust in the US. Stripe rust has also been reported in Ontario, and southern Alberta in Canada. Barley stripe rust has been reported in California, Oregon, and Washington.

Stem rust infection on barberry

Rust aecia, which are assumed as stem rust based on our past experience and this year's data, were observed, but at very low levels (less than one pustule every 1000 leaves or berries) on leaves barberry bushes near Potlatch in the Latah County, Idaho and east of Colfax in Whitman County, Washington. No stem rust was observed in the spring barley (at heading stage) fields surrounding the bushes near Potlatch. Therefore, stem rust will likely be at a relatively low level on wheat and barley, compared to the last year.