

Summary of Stripe Rust Races in 2007 and Update of 2008 Races

Summary of 2007 Races:

- A total of 240 stripe rust samples were obtained from 15 states, of which 141 (132 wheat stripe rust and 9 barley stripe rust) were successfully identified to races. Other samples did not produce race data due to various reasons, such as samples with resistance reaction, too old or lost viability during shipping, and our poor handling of the samples.
- A total of 30 *Puccinia striiformis* f. sp. *tritici* (PST, wheat stripe rust) and 5 *P. striiformis* f. sp. *hordei* (PSH, barley stripe rust) races were identified.
- The most predominant races were PST-114 and PST-116 with nationwide frequencies of 16.7 and 15.9%, respectively. These two races actually were restricted in the Pacific Northwest. Races with frequencies over 5% were PST-115 (7.6%), PST-102 (6.1%), and PST-113 (5.3%, only in California).
- Eleven new PST races were identified, which were named from PST-127 to PST-137. Their frequencies were low, from 1 to 6 samples, as generally for new races. The most important new races are those virulent on differentials 13 (Tyee with resistance gene *YrTyee*) and 15 (Hyak with *Yr17* and *YrTyee*), including PST-127, PST-132, PST-136, and PST-137. Race PST-45 virulent on Hyak was first detected in 1990 and became predominant in 1990s in the PNW. This race has been hard to detect for more than 15 years. Races PST-127 and PST-137 have combinations of virulences to Tyee and Hyak with the *Yr8* and *Yr9* virulences in most predominant races in the recent eight years. PST-127, which was detected from one sample each from California and Washington, has virulences to all differentials except for Moro (*Yr10* and *YrMor*), *Yr5*, and Tres (*YrTr1* and *YrTr2*). The appearance the Hyak virulent races is a warning for use *Yr17* alone in breeding programs. As new races spread quickly in the recent years, these *Yr17* virulent races could spread from California and Washington to other states.
- The *Yr5* isogenic line is the only one of the 20 differential without corresponding virulent races. Although the *Yr15* isogenic has not been used as a differential, we tested it with the new races and none of them were virulent. Similar to *Yr5*, it also was resistant in nurseries planted in various locations. Therefore, both *Yr5* and *Yr15* are still effective against all races identified so far in the US.
- Cultivars with high-temperature, adult-plant (HTAP) resistance were still resistant in various locations, demonstrating that this type of resistance is non-race specific and durable. It should be used over race-specific all-stage (or seedling) resistance in breeding programs or used in combination with genes, such as *Yr5* and *Yr15*, conferring effective all-stage resistance.

Update of Race Identifications in 2008:

The race ID work is much smooth in 2008. The following summarizes the progress:

- We have collected and received over 250 stripe rust samples from 15 states, 23 from barley, 11 from grasses, 3 from triticale and the remaining from wheat.

- So far, we have identified 17 PST races from 49 wheat and grass samples and 4 PSH races from 7 barley samples. Most of the completed samples were from early collections from California, Louisiana, Texas, Arkansas, and western Washington.
- Wheat stripe rust samples from California were identified as PST-98 (1 sample), PST-100 (3 samples), PST-101 (6 samples), PST-127 (1 sample), and PST-129 (4 samples). One sample from Louisiana was PST-78, one from Arkansas was PST-98, and one from Texas was PST-110. Samples from western Washington were identified as PST-25 (3 samples), PST-35 (1), PST-54 (7), PST-92 (6), PST-94 (2), PST-98 (1), PST-100 (1), PST-109 (1), PST-114 (3), PST-119 (1), and PST-130 (2). Two samples from the Horse Heaven Hills region (south-central Washington) were identified as PST-98.
- The four barley stripe rust races were PSH-33 (3 samples from California), PSH-46 (one sample from California), PSH-54 (2 samples from western Washington), and PSH-70 (one sample from western Washington).