63-8 Genetic Analysis of Durable Yellow and Leaf Rust Resistance in Hexaploid Wheat Line “Quaiu 3”.

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Monday, November 1, 2010
Long Beach Convention Center, Exhibit Hall BC, Lower Level

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Though scientists have been investing their efforts to identify rust resistance genes for the last fifty years, their successes have been transient due to continuous emergence of new pathogen races in short spans of time. Achieving durable resistance to stripe (YR, caused by *Puccinia striiformis* Westend) and leaf rust (LR, caused by *Puccinia recondita* f.sp. *tritici*) in wheat (*Triticum aestivum* Desf.) has been a major objective of breeding program for long. The durability of resistance to YR and LR is considered to be associated with non-hypersensitive adult-plant resistance (APR) genes which are inherited quantitatively. In addition to major, slow rusting genes ‘Lr34’ (for leaf rust) and ‘Yr18’ (for yellow rust), involvement of several additive minor genes has been reported in wheat germplasm by different scientists. Several phenotypic screenings have shown that durable resistance provided by ‘Quaiu 3’ seems to be unique and promising, which, after characterizing in molecular level for both rust types, can be combined with other sources to achieve higher level of durable resistance in the future. The objective of this study is to analyze the inheritance pattern of durable resistance in the spring wheat line Quaiu 3, and map the resistant genes using molecular markers. One hundred and ninety seven $F_{4:5}$ recombinant inbred lines (RILs) derived from Quaiu 3 and ‘Avocet-YrA’ were evaluated for adult plant resistance to YR and LR in artificially inoculated field in Mexico during 2009 and 2010. The disease severity and infection type data showed that there are 2-3 adult plant resistance genes associated with LR and YR resistance. These genes should be of particular interest to further characterize and introgress into elite wheat germplasm in the future as they showed large effects on resistance. Further phenotypic evaluation and molecular mapping for the resistance genes will be carried out in the future.

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