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P133: General

Development And Validation Of Diagnostic Markers For Wheat Stress Traits In Of Great Plains Of North America

Shuyu Liu[1] , Jackie C. Rudd[1] , Amir M. Ibrahim[2] , Scott D. Haley[3] , Guihua Bai[4] , Carl A. Griffey[5] , Gina Brown-Guedira[6]

[1] Texas AgriLife Research and Extension Center, Texas A&M University System, 6500 Amarillo Blvd W., Amarillo, TX 79106, USA
[2] Dep. of Soil and Crop Sciences, College of Agriculture and Life Sciences, Texas A&M University, 2474 TAMU, College Station, Texas, 77843-2474, USA
[3] Soil and Crop Sciences Department, C-136 Plant Science Building, Colorado State University, Fort Collins, CO 80523, USA
[4] USDA-ARS, GMPRC 4008 Throckmorton Hall - KSU MANHATTAN, KS, 66506, USA
[5] 330A Smyth Hall, Dept. of Crop and Soil Environmental Science, Virginia Tech, Blacksburg, VA, 24060, USA
[6] Eastern Regional Small Grains Genotyping Lab, USDA-ARS, 4114 Williams Hall, Raleigh, NC 27695, USA

Drought, insects, wheat rusts and streak mosaic virus are major stresses for wheat production in Great Plains. Genes or QTL have been identified from many sources and they are very effective in certain areas. Molecular markers linked to some effective genes and QTL for tolerance or resistance to these stresses are available. Due to the specificity of these markers for certain genetic backgrounds, their applications should be validated before wide utilization in marker-assisted selection for these traits. Molecular markers tightly linked to these effective genes/QTL from publications, USDA-ARS genotyping laboratories and university breeding programs will be used to screen original resistant sources and current germplasm lines and cultivars which have been intensively used in developing breeding populations. Haplotype of markers alleles will be compared and the linkage and effectiveness of certain favorable alleles can be identified. We will use those favorable marker alleles by descent but not by state. These markers will be used to screen the target traits in breeding populations to reduce the population size but maintain the frequency of favorable alleles. These markers can also be used to transfer genes or major QTL through backcrossing and MAS or pyramid multiple genes for various major stresses. This will increase the efficiency and accuracy of marker-assisted breeding for those target stress traits in the Great Plains of North America.