Supplemental Fig. S1. Dendrogram of a collection of 55 germplasm lines and cultivars in the U.S. Great Plains with various genes based on 289 loci of 44 markers linked 22 genes. Wheat lines include nine resistant to Russian wheat aphid, seven resistant to Hessian fly, 15 resistant to greenbug, 21 resistant to rusts, and three resistant to wheat streak mosaic (WSM). Marker screening procedures were followed protocols from Liu et al. (2013a). The marker data were collected in the wheat breeding laboratory of Virginia Tech at Blacksburg, VA and USDA-ARS Eastern Regional Small Grains Genotyping Lab at Raleigh, NC using ABI3130xl. The Dendrograms of wheat lines were analyzed using TASSEL with unweighted pair-group method using the arithmetic average (UPGMA) (http://www.maizegenetics.net/index.php?option=com_content&task=view&id=89&Itemid=119, accessed on January 7, 2013). The tree text file from TASSEL was imported into Interactive Tree of Life (ITOL, http://itol.embl.de/, accessed on April 17, 2013) and a standard tree was output as png image. Genes are inside the parentheses.
Supplemental Fig. S2. A circular tree of 174 unique wheat advanced breeding lines from southern regional uniform nursery (SRPN) test from 2008 to 2012 (SRPN, 2013) based on 104 marker loci linked to various genes across the whole genomes. The 104 markers ranged from 42
to 76 were screened on SRPN lines from 2008 to 2012 by USDA-ARS Central Small Grain Genotyping Laboratory at Manhattan, KS following protocols from Bernardo et al. (2013). These markers linked to 43 genes associated with disease and insect resistance, aluminum tolerance, post-harvesting germination, height, photoperiod sensitivity and vernalization. Data analysis procedures using TASSEL and ITOL were same as those described in Supplemental Fig. S1.