

**Marker-Trait Associations for Enhancing Agronomic Performance, Disease Resistance,  
and Grain Quality in Synthetic and Bread Wheat Accessions in Western Siberia**

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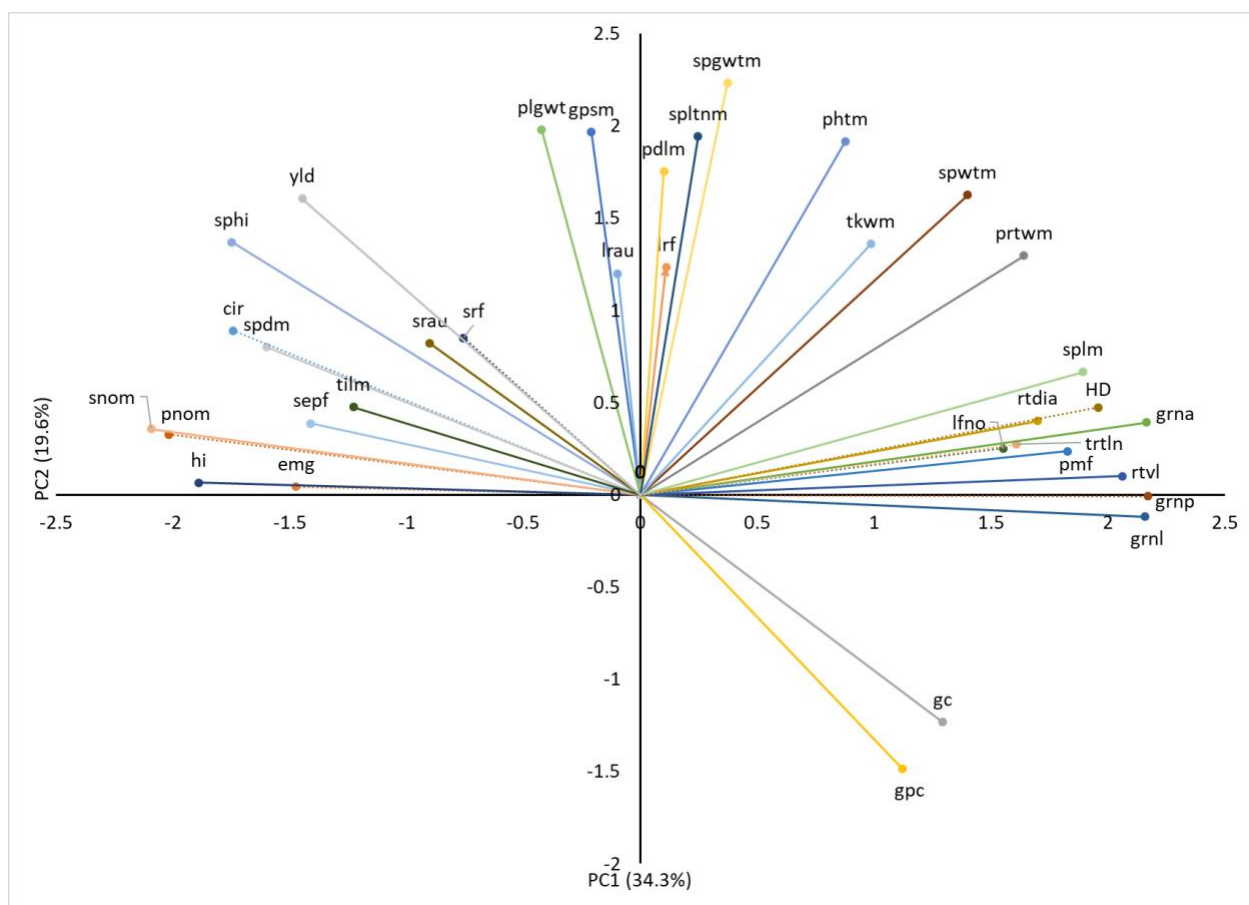


Figure S2. Principal component biplot analysis showing association among agronomic, diseases resistance, and grain quality traits in 143 diverse wheat accessions in 2017. Note: emg, emergence; HD, heading date; pmf, powdery mildew; lrf, leaf rust; lrau, leaf rust area under disease progress curve (AUDPC); srf, stem rust; srau, stem rust AUDPC; sepf, septoria; yld, grain yield; lfno, leaf number; gpc, grain protein concentration; gc, gluten content; grna, grain area; grnp, grain perimeter; grnl, grain length; cir, grain circularity; pnom, number of plants at maturity; snom, number of spikes at maturity; prtwm, dry plant weight with roots at maturity; tiln, number of productive tillers at maturity ; pdlm, peduncle length at maturity; phtn, plant height at maturity; splm, spike length at maturity; spltnm, spikelets number at maturity; spwtm, spike weight at maturity; spdm, spike density at maturity; gspm, grains per spike at maturity; hi, harvest index; trtln, total root length; spgwtm, grain weight per spike at maturity; plgwt, grain weight per plant; tkwm, thousand kernel weight ; sphl, spike harvest index; rtdia, root diameter; and rtrl, root volume.