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ACCEPTED MANUSCRIPT

A Comparison Between Genotyping-by-sequencing and Array-based Scoring of SNPs for Genomic Prediction Accuracy in Winter Wheat

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Abstract:

The utilization of DNA molecular markers in plant breeding to maximize selection response via marker-assisted selection (MAS) and genomic selection (GS) has revolutionized plant breeding. A key factor affecting GS applicability is the choice of molecular marker platform. Genotyping-by-sequencing scored SNPs (GBS-scored SNPs) provides a large number of markers, albeit with high rates of missing data. Array scored SNPs are of high quality, but the cost per sample is substantially higher. The objectives of this study were 1) compare GBS-scored SNPs, and array scored SNPs for genomic selection applications, and 2) compare estimates of genomic kinship and population structure calculated using the two marker platforms. SNPs were compared in a diversity panel consisting of 299 hard winter wheat (*Triticum aestivum* L.) accessions that were part of a multi-year, multi-environments association mapping study. The panel was phenotyped in Ithaca, Nebraska for heading date, plant height, days to physiological maturity and grain yield in 2012 and 2013. The panel was genotyped using

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