**Table S5 GBLUP accuracies in simulation data assuming random additive effects and directional dominance effects values (mean ± standard deviation, n = 10 repeats)**

| $h^2$ | SNP set | $R_a$ | $\hat{R}_a$ | $R_d$ | $\hat{R}_d$ | $R_g$ | $\hat{R}_g$ |
|---|---|---|---|---|---|---|---|
| $h_\alpha^2$=0.05 | 1K_QTL | 0.45±0.10[b] | 0.40±0.06 | 0.43±0.06 | 0.50±0.04 | 0.50±0.05 | 0.51±0.03 |
| $h_\delta^2$=0.05 | 3K | 0.38±0.07 | 0.29±0.06 | 0.32±0.07 | 0.36±0.03 | 0.41±0.07 | 0.43±0.03 |
| | 7K | 0.37±0.09 | 0.31±0.07 | 0.37±0.05 | 0.38±0.03 | 0.44±0.06 | 0.44±0.03 |
| | 41K | 0.36±0.12 | 0.32±0.07 | 0.40±0.07 | 0.38±0.03 | 0.48±0.06 | 0.43±0.03 |
| $h_\alpha^2$=0.05 | 1K_QTL | 0.48±0.02 | 0.40±0.03 | 0.61±0.03 | 0.67±0.02 | 0.63±0.03 | 0.67±0.01 |
| $h_\delta^2$=0.15 | 3K | 0.45±0.06 | 0.27±0.04 | 0.48±0.05 | 0.50±0.02 | 0.55±0.04 | 0.55±0.02 |
| | 7K | 0.45±0.06 | 0.30±0.04 | 0.52±0.04 | 0.52±0.01 | 0.58±0.03 | 0.56±0.01 |
| | 41K | 0.42±0.08 | 0.31±0.04 | 0.62±0.04 | 0.50±0.02 | 0.67±0.03 | 0.55±0.02 |
| $h_\alpha^2$=0.05 | 1K_QTL | 0.48±0.05 | 0.41±0.05 | 0.72±0.01 | 0.79±0.02 | 0.73±0.01 | 0.78±0.01 |
| $h_\delta^2$=0.30 | 3K | 0.48±0.05 | 0.25±0.04 | 0.57±0.03 | 0.63±0.02 | 0.62±0.03 | 0.67±0.01 |
| | 7K | 0.46±0.06 | 0.29±0.04 | 0.61±0.02 | 0.65±0.02 | 0.66±0.03 | 0.68±0.02 |
| | 41K | 0.38±0.10 | 0.32±0.04 | 0.72±0.03 | 0.64±0.02 | 0.76±0.02 | 0.67±0.02 |
| $h_\alpha^2$=0.15 | 1K_QTL | 0.65±0.04 | 0.60±0.02 | 0.42±0.07 | 0.45±0.03 | 0.64±0.04 | 0.62±0.02 |
| $h_\delta^2$=0.05 | 3K | 0.56±0.04 | 0.46±0.04 | 0.29±0.10 | 0.31±0.02 | 0.55±0.04 | 0.52±0.02 |
| | 7K | 0.57±0.04 | 0.48±0.04 | 0.30±0.12 | 0.32±0.02 | 0.58±0.04 | 0.53±0.02 |
| | 41K | 0.56±0.05 | 0.50±0.04 | 0.41±0.09 | 0.31±0.03 | 0.61±0.06 | 0.54±0.02 |
| $h_\alpha^2$=0.15 | 1K_QTL | 0.66±0.04 | 0.61±0.02 | 0.58±0.03 | 0.65±0.03 | 0.69±0.03 | 0.71±0.01 |
| $h_\delta^2$=0.15 | 3K | 0.59±0.02 | 0.46±0.03 | 0.43±0.08 | 0.48±0.02 | 0.61±0.03 | 0.61±0.01 |
| | 7K | 0.60±0.02 | 0.49±0.03 | 0.46±0.09 | 0.50±0.02 | 0.65±0.03 | 0.63±0.01 |
| | 41K | 0.59±0.02 | 0.51±0.02 | 0.55±0.06 | 0.49±0.02 | 0.70±0.03 | 0.62±0.02 |
| $h_\alpha^2$=0.15 | 1K_QTL | 0.66±0.03 | 0.62±0.03 | 0.72±0.02 | 0.78±0.02 | 0.76±0.02 | 0.80±0.01 |
| $h_\delta^2$=0.30 | 3K | 0.60±0.03 | 0.43±0.03 | 0.54±0.04 | 0.62±0.01 | 0.66±0.03 | 0.71±0.01 |
| | 7K | 0.59±0.04 | 0.46±0.03 | 0.59±0.04 | 0.64±0.02 | 0.71±0.03 | 0.72±0.01 |
| | 41K | 0.57±0.04 | 0.50±0.04 | 0.71±0.03 | 0.62±0.02 | 0.81±0.04 | 0.71±0.01 |
| $h_\alpha^2$=0.30 | 1K_QTL | 0.77±0.02 | 0.75±0.01 | 0.44±0.06 | 0.48±0.04 | 0.76±0.02 | 0.76±0.02 |
| $h_\delta^2$=0.05 | 3K | 0.66±0.03 | 0.61±0.02 | 0.24±0.12 | 0.31±0.04 | 0.66±0.03 | 0.65±0.02 |
| | 7K | 0.67±0.03 | 0.64±0.02 | 0.28±0.14 | 0.31±0.04 | 0.68±0.03 | 0.67±0.02 |
| | 41K | 0.68±0.03 | 0.66±0.02 | 0.39±0.10 | 0.32±0.04 | 0.72±0.02 | 0.68±0.02 |
| $h_\alpha^2$=0.30 | 1K_QTL | 0.78±0.02 | 0.75±0.01 | 0.62±0.03 | 0.67±0.02 | 0.79±0.01 | 0.79±0.01 |
| $h_\delta^2$=0.15 | 3K | 0.68±0.03 | 0.59±0.01 | 0.39±0.09 | 0.49±0.02 | 0.69±0.03 | 0.70±0.02 |
| | 7K | 0.69±0.03 | 0.62±0.01 | 0.44±0.08 | 0.50±0.03 | 0.72±0.04 | 0.72±0.01 |
| | 41K | 0.70±0.03 | 0.64±0.02 | 0.53±0.07 | 0.51±0.02 | 0.78±0.04 | 0.72±0.01 |
| $h_\alpha^2$=0.30 | 1K_QTL | 0.80±0.01 | 0.77±0.01 | 0.74±0.02 | 0.80±0.01 | 0.80±0.01 | 0.85±0.01 |
| $h_\delta^2$=0.30 | 3K | 0.69±0.02 | 0.58±0.01 | 0.54±0.03 | 0.61±0.01 | 0.73±0.02 | 0.78±0.01 |
| | 7K | 0.70±0.02 | 0.62±0.01 | 0.57±0.03 | 0.63±0.01 | 0.78±0.01 | 0.80±0.01 |
| | 41K | 0.71±0.02 | 0.65±0.01 | 0.69±0.03 | 0.63±0.02 | 0.87±0.03 | 0.80±0.01 |

$h_\alpha^2$ is true additive heritability, $h_\delta^2$ is true dominance heritability, $R_a$ is predicted accuracy of GBLUP of breeding values, $\hat{R}_a$ is observed accuracy of GBLUP of breeding values, $R_d$ is predicted accuracy of GBLUP of dominance deviations, $\hat{R}_d$ is observed accuracy of GBLUP of dominance deviations, $R_g$ is predicted accuracy of GBLUP of genotypic values, $\hat{R}_g$ is observed accuracy of GBLUP of genotypic values.