Supplemental Data: Fiedler et al. Genomic Prediction Accuracy for Switchgrass Traits Related to Bioenergy Within Differentiated Populations



Figure S1. Correllelogram depicting positive (blue) and negative (red) correlations among whole plant traits. Color scale on right indicates Pearson correlation coefficient *r*.



Figure S2. Correllelogram depicting positive (blue) and negative (red) correlations among wall composition traits determined by NIR. Color scale on right indicates Pearson correlation coefficient *r.*



Figure S3. Boxplots of (a) ANT, (b) IVDMD, and (c) YLD for each population. Bottom and top of each box represent the first and third quartiles. Horizontal line represents the median, whiskers extend to the most extreme data point that is no more than 1.5 times the interquartile range from the box.

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| Table S1: kin-BLUP regression statistics from 20 replicates of 5-fold CV. |
| **TRAIT** | **POP** | **MSE1** | **INTER2** | **SLOPE** | **STDEV3** |
| ANT | All | 0.18 | 0 | 0.95 | 0.026 |
|  | K | 0.06 | 0.69 | 0.09 | 0.197 |
|  | KxS | 0.25 | -0.03 | 0.54 | 0.216 |
|  | Low | 0.12 | -0.12 | 1.18 | 0.07 |
|  | N1 | 0.16 | -0.16 | 1.27 | 0.158 |
|  | N1EM | 0.16 | -0.03 | 0.73 | 0.195 |
|  | S | 0.31 | -1.28 | 0.16 | 0.341 |
| ASH | All | 0.19 | 0 | 0.72 | 0.061 |
|  | K | 0.14 | -0.02 | 0.52 | 0.215 |
|  | KxS | 0.2 | 0.09 | 0.71 | 0.186 |
|  | Low | 0.13 | -0.05 | 0.56 | 0.11 |
|  | N1 | 0.12 | -0.09 | 0.47 | 0.213 |
|  | N1EM | 0.13 | -0.14 | 0.43 | 0.216 |
|  | S | 0.39 | -0.04 | 0.7 | 0.183 |
| AX | All | 0.24 | 0 | 0.7 | 0.066 |
|  | K | 0.19 | -0.15 | 0.41 | 0.217 |
|  | KxS | 0.21 | -0.01 | 0.74 | 0.182 |
|  | Low | 0.23 | -0.07 | 0.51 | 0.092 |
|  | N1 | 0.28 | -0.09 | 0.42 | 0.203 |
|  | N1EM | 0.22 | -0.07 | 0.43 | 0.197 |
|  | S | 0.29 | 0.39 | 0.3 | 0.252 |
| ETOH | All | 0.29 | 0 | 0.82 | 0.059 |
|  | K | 0.25 | 0.02 | 0.64 | 0.209 |
|  | KxS | 0.28 | 0.07 | 1.15 | 0.165 |
|  | Low | 0.28 | 0.03 | 0.76 | 0.109 |
|  | N1 | 0.33 | 0.1 | 0.87 | 0.202 |
|  | N1EM | 0.25 | -0.03 | 0.75 | 0.21 |
|  | S | 0.37 | -0.18 | 0.57 | 0.2 |
| FAT | All | 0.12 | 0 | 0.73 | 0.047 |
|  | K | 0.1 | -0.02 | 0.69 | 0.2 |
|  | KxS | 0.16 | -0.29 | 0.27 | 0.209 |
|  | Low | 0.09 | -0.08 | 1 | 0.096 |
|  | N1 | 0.08 | -0.14 | 1.24 | 0.147 |
|  | N1EM | 0.09 | -0.09 | 0.99 | 0.172 |
|  | S | 0.19 | -0.35 | -0.02 | 0.225 |
| FEST | All | 0.21 | 0 | 0.9 | 0.028 |
|  | K | 0.14 | 0.39 | 0.28 | 0.232 |
|  | KxS | 0.28 | 0.08 | 1.13 | 0.163 |
|  | Low | 0.17 | -0.03 | 0.96 | 0.091 |
|  | N1 | 0.2 | 0.04 | 0.82 | 0.231 |
|  | N1EM | 0.17 | -0.18 | 1.17 | 0.182 |
|  | S | 0.27 | -0.25 | 0.73 | 0.264 |
| FRU | All | 0.25 | 0 | 0.73 | 0.064 |
|  | K | 0.29 | 0.13 | 0.23 | 0.231 |
|  | KxS | 0.15 | 0.12 | 1.3 | 0.149 |
|  | Low | 0.28 | 0.05 | 0.6 | 0.111 |
|  | N1 | 0.3 | 0.26 | 0.46 | 0.172 |
|  | N1EM | 0.24 | 0.04 | 0.17 | 0.21 |
|  | S | 0.26 | -0.38 | 0.23 | 0.265 |
| GLCS | All | 0.29 | 0 | 0.78 | 0.052 |
|  | K | 0.32 | 0.18 | 0.24 | 0.224 |
|  | KxS | 0.25 | 0.08 | 1.17 | 0.135 |
|  | Low | 0.3 | 0.18 | 0.33 | 0.107 |
|  | N1 | 0.3 | 0.31 | 0.33 | 0.21 |
|  | N1EM | 0.27 | 0.18 | 0.08 | 0.206 |
|  | S | 0.35 | -0.2 | 0.55 | 0.225 |
| GRN | All | 0.51 | 0 | 0.43 | 0.271 |
|  | K | 1.45 | 1.36 | -1.85 | 0.238 |
|  | KxS | 0.15 | -0.28 | 0.03 | 0.231 |
|  | Low | 0.6 | 0.48 | -0.38 | 0.141 |
|  | N1 | 0.11 | 0.07 | 0.43 | 0.21 |
|  | N1EM | 0.12 | 0.25 | 0 | 0.219 |
|  | S | 0.7 | -0.35 | 0.16 | 0.346 |
| HEX | All | 0.19 | 0 | 0.81 | 0.038 |
|  | K | 0.19 | -0.18 | 1.24 | 0.194 |
|  | KxS | 0.2 | 0.08 | 1.14 | 0.208 |
|  | Low | 0.16 | 0.08 | 0.64 | 0.1 |
|  | N1 | 0.17 | 0.33 | -0.05 | 0.198 |
|  | N1EM | 0.12 | 0.2 | 0.5 | 0.191 |
|  | S | 0.29 | 0.14 | 0.9 | 0.19 |
| HEXE | All | 0.18 | 0 | 0.7 | 0.056 |
|  | K | 0.14 | -0.13 | 1.06 | 0.185 |
|  | KxS | 0.18 | 0.11 | 1.17 | 0.22 |
|  | Low | 0.14 | 0.03 | 0.6 | 0.089 |
|  | N1 | 0.14 | 0.27 | -0.11 | 0.19 |
|  | N1EM | 0.13 | 0.07 | 0.61 | 0.18 |
|  | S | 0.35 | -0.04 | 0.64 | 0.24 |
| HEXEP | All | 0.19 | 0 | 0.68 | 0.053 |
|  | K | 0.17 | 0.04 | 0.4 | 0.196 |
|  | KxS | 0.17 | 0.06 | 1.01 | 0.161 |
|  | Low | 0.18 | -0.05 | 0.85 | 0.106 |
|  | N1 | 0.18 | 0.08 | 0.86 | 0.198 |
|  | N1EM | 0.19 | -0.12 | 0.82 | 0.207 |
|  | S | 0.28 | -0.09 | 0.53 | 0.195 |
| IVDMD | All | 0.17 | 0 | 0.71 | 0.054 |
|  | K | 0.14 | 0.12 | 0.44 | 0.197 |
|  | KxS | 0.14 | 0.05 | 0.96 | 0.2 |
|  | Low | 0.15 | -0.03 | 0.81 | 0.11 |
|  | N1 | 0.14 | 0.21 | 0.45 | 0.211 |
|  | N1EM | 0.15 | -0.06 | 0.62 | 0.215 |
|  | S | 0.28 | -0.15 | 0.48 | 0.213 |
| NSC | All | 0.33 | 0 | 0.81 | 0.06 |
|  | K | 0.37 | 0.09 | 0.6 | 0.212 |
|  | KxS | 0.31 | 0.02 | 1.05 | 0.175 |
|  | Low | 0.34 | 0.05 | 0.68 | 0.094 |
|  | N1 | 0.39 | 0.24 | 0.52 | 0.208 |
|  | N1EM | 0.26 | 0.02 | 0.32 | 0.193 |
|  | S | 0.32 | -0.05 | 0.69 | 0.201 |
| NSCE | All | 0.3 | 0 | 0.77 | 0.061 |
|  | K | 0.32 | 0.1 | 0.5 | 0.173 |
|  | KxS | 0.29 | 0.04 | 1.06 | 0.164 |
|  | Low | 0.29 | 0.03 | 0.69 | 0.097 |
|  | N1 | 0.33 | 0.25 | 0.43 | 0.213 |
|  | N1EM | 0.23 | -0.03 | 0.39 | 0.202 |
|  | S | 0.3 | 0.16 | 0.91 | 0.203 |
| PCA | All | 0.22 | 0 | 0.82 | 0.039 |
|  | K | 0.16 | 0.17 | 0.58 | 0.25 |
|  | KxS | 0.25 | 0.07 | 1.05 | 0.197 |
|  | Low | 0.18 | -0.1 | 1.05 | 0.106 |
|  | N1 | 0.2 | 0.14 | 0.32 | 0.205 |
|  | N1EM | 0.17 | -0.24 | 1.38 | 0.154 |
|  | S | 0.33 | -0.06 | 0.77 | 0.272 |
| PPEN | All | 0.26 | 0 | 0.83 | 0.041 |
|  | K | 0.25 | 0.15 | 1.26 | 0.192 |
|  | KxS | 0.21 | 0.01 | 0.93 | 0.199 |
|  | Low | 0.25 | 0 | 0.86 | 0.105 |
|  | N1 | 0.32 | -0.11 | 0.41 | 0.168 |
|  | N1EM | 0.18 | -0.03 | 0.83 | 0.193 |
|  | S | 0.3 | 0.23 | 0.61 | 0.227 |
| PSOL | All | 0.32 | 0 | 0.8 | 0.057 |
|  | K | 0.38 | 0.09 | 0.48 | 0.172 |
|  | KxS | 0.27 | 0.04 | 1.1 | 0.157 |
|  | Low | 0.35 | 0.04 | 0.71 | 0.089 |
|  | N1 | 0.41 | 0.22 | 0.62 | 0.216 |
|  | N1EM | 0.26 | -0.01 | 0.24 | 0.222 |
|  | S | 0.27 | -0.07 | 0.67 | 0.211 |
| SC | All | 0.31 | 0 | 0.85 | 0.054 |
|  | K | 0.36 | 0.15 | 0.54 | 0.169 |
|  | KxS | 0.26 | 0.07 | 1.21 | 0.156 |
|  | Low | 0.34 | 0 | 0.85 | 0.094 |
|  | N1 | 0.37 | 0.31 | 0.51 | 0.21 |
|  | N1EM | 0.29 | -0.03 | 0.35 | 0.235 |
|  | S | 0.29 | -0.15 | 0.63 | 0.239 |
| SUC | All | 0.27 | 0 | 0.81 | 0.056 |
|  | K | 0.32 | 0.13 | 0.47 | 0.2 |
|  | KxS | 0.22 | 0.12 | 1.26 | 0.164 |
|  | Low | 0.28 | 0 | 0.84 | 0.104 |
|  | N1 | 0.31 | 0.17 | 0.75 | 0.196 |
|  | N1EM | 0.22 | 0.02 | 0.32 | 0.178 |
|  | S | 0.28 | -0.35 | 0.41 | 0.251 |
| UA | All | 0.16 | 0 | 0.65 | 0.06 |
|  | K | 0.14 | 0.02 | 0.38 | 0.213 |
|  | KxS | 0.14 | -0.06 | 0.49 | 0.252 |
|  | Low | 0.13 | -0.03 | 0.78 | 0.11 |
|  | N1 | 0.12 | 0.22 | 0.12 | 0.232 |
|  | N1EM | 0.15 | -0.09 | 0.96 | 0.176 |
|  | S | 0.28 | -0.42 | 0.12 | 0.249 |
| YLD | All | 0.15 | 0 | 0.58 | 0.053 |
|  | K | 0.17 | 0.22 | 0.17 | 0.18 |
|  | KxS | 0.12 | -0.11 | 0.05 | 0.251 |
|  | Low | 0.15 | -0.01 | 0.62 | 0.107 |
|  | N1 | 0.15 | 0.06 | 0.07 | 0.203 |
|  | N1EM | 0.15 | 0.04 | 0.57 | 0.18 |
|  | S | 0.19 | -0.2 | 0.37 | 0.281 |
| 1mean squared error2average intercept of the regression3standard deviation of the accuracy across folds and replicates |

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| Table S2: Partial Least Squares regression statistics from 20 replicates of 5-fold CV.  |
| **TRAIT** | **POP** | **MSE1** | **INTER2** | **SLOPE** | **SDEV3** |
| ANT | All | 0.24 | 0 | 1 | 0.024 |
|  | K | 0.09 | 0.92 | -0.09 | 0.213 |
|  | KxS | 0.34 | -0.05 | 0.5 | 0.191 |
|  | Low | 0.16 | 0.03 | 0.98 | 0.073 |
|  | N1 | 0.21 | -0.06 | 1.14 | 0.161 |
|  | N1EM | 0.21 | 0.09 | 0.45 | 0.192 |
|  | S | 0.41 | -1.47 | 0.15 | 0.341 |
| ASH | All | 0.67 | 0.01 | 0.95 | 0.063 |
|  | K | 0.51 | -0.18 | 0.35 | 0.271 |
|  | KxS | 0.77 | 0.35 | 0.64 | 0.21 |
|  | Low | 0.47 | -0.21 | 0.53 | 0.105 |
|  | N1 | 0.43 | -0.24 | 0.45 | 0.165 |
|  | N1EM | 0.49 | -0.33 | 0.5 | 0.227 |
|  | S | 1.27 | 0.17 | 0.74 | 0.215 |
| AX | All | 0.69 | 0 | 0.89 | 0.058 |
|  | K | 0.57 | -0.38 | 0.28 | 0.214 |
|  | KxS | 0.67 | 0.07 | 0.64 | 0.202 |
|  | Low | 0.68 | -0.24 | 0.41 | 0.103 |
|  | N1 | 0.8 | -0.14 | 0.58 | 0.167 |
|  | N1EM | 0.7 | -0.26 | 0.22 | 0.205 |
|  | S | 0.73 | 0.71 | 0.38 | 0.237 |
| ETOH | All | 0.6 | 0 | 0.97 | 0.053 |
|  | K | 0.48 | 0.03 | 0.8 | 0.147 |
|  | KxS | 0.6 | -0.07 | 0.96 | 0.19 |
|  | Low | 0.57 | 0.1 | 0.8 | 0.116 |
|  | N1 | 0.7 | 0.19 | 0.96 | 0.229 |
|  | N1EM | 0.53 | 0.12 | 0.51 | 0.161 |
|  | S | 0.69 | -0.32 | 0.67 | 0.247 |
| FAT | All | 0.54 | -0.01 | 0.98 | 0.044 |
|  | K | 0.45 | 0.16 | 0.53 | 0.228 |
|  | KxS | 0.82 | -0.81 | 0.17 | 0.177 |
|  | Low | 0.41 | 0.04 | 0.97 | 0.088 |
|  | N1 | 0.36 | -0.18 | 1.47 | 0.145 |
|  | N1EM | 0.39 | 0.04 | 0.94 | 0.184 |
|  | S | 0.71 | -0.75 | 0.03 | 0.236 |
| FEST | All | 0.32 | 0 | 1 | 0.028 |
|  | K | 0.24 | 0.59 | 0.15 | 0.216 |
|  | KxS | 0.46 | -0.02 | 0.96 | 0.214 |
|  | Low | 0.26 | 0.13 | 0.8 | 0.111 |
|  | N1 | 0.29 | 0.07 | 0.88 | 0.207 |
|  | N1EM | 0.25 | -0.01 | 0.93 | 0.197 |
|  | S | 0.36 | -0.03 | 1 | 0.196 |
| FRU | All | 0.66 | 0 | 0.93 | 0.06 |
|  | K | 0.77 | 0.24 | 0.27 | 0.212 |
|  | KxS | 0.48 | -0.05 | 1 | 0.184 |
|  | Low | 0.75 | 0.18 | 0.6 | 0.111 |
|  | N1 | 0.86 | 0.38 | 0.68 | 0.196 |
|  | N1EM | 0.66 | 0.12 | 0.11 | 0.22 |
|  | S | 0.54 | -0.64 | 0.33 | 0.244 |
| GLCS | All | 0.6 | 0 | 0.94 | 0.056 |
|  | K | 0.69 | 0.33 | 0.15 | 0.214 |
|  | KxS | 0.54 | -0.07 | 0.94 | 0.169 |
|  | Low | 0.61 | 0.26 | 0.43 | 0.107 |
|  | N1 | 0.66 | 0.47 | 0.36 | 0.208 |
|  | N1EM | 0.54 | 0.2 | 0.26 | 0.182 |
|  | S | 0.6 | 0.09 | 1.06 | 0.19 |
| GRN | All | 0.83 | 0 | 0.78 | 0.232 |
|  | K | 3.12 | 2.16 | -3.85 | 0.26 |
|  | KxS | 0.17 | -0.59 | -0.28 | 0.183 |
|  | Low | 1.27 | 0.88 | -1.09 | 0.124 |
|  | N1 | 0.21 | 0.52 | -0.06 | 0.241 |
|  | N1EM | 0.14 | 0.4 | -0.04 | 0.239 |
|  | S | 0.16 | -0.7 | 0.21 | 0.314 |
| HEX | All | 0.39 | 0 | 0.98 | 0.039 |
|  | K | 0.42 | 0.24 | 0.58 | 0.208 |
|  | KxS | 0.42 | -0.02 | 1.04 | 0.166 |
|  | Low | 0.35 | 0.28 | 0.5 | 0.095 |
|  | N1 | 0.34 | 0.34 | 0.25 | 0.213 |
|  | N1EM | 0.27 | 0.43 | 0.4 | 0.244 |
|  | S | 0.51 | 0 | 1 | 0.208 |
| HEXE | All | 0.58 | 0 | 0.97 | 0.059 |
|  | K | 0.46 | 0.1 | 0.65 | 0.198 |
|  | KxS | 0.59 | -0.02 | 1.08 | 0.203 |
|  | Low | 0.45 | 0.2 | 0.55 | 0.106 |
|  | N1 | 0.46 | 0.38 | 0.14 | 0.199 |
|  | N1EM | 0.43 | 0.26 | 0.6 | 0.213 |
|  | S | 0.95 | -0.1 | 0.9 | 0.19 |
| HEXEP | All | 0.66 | 0 | 0.95 | 0.061 |
|  | K | 0.55 | 0.05 | 0.63 | 0.161 |
|  | KxS | 0.69 | -0.1 | 0.73 | 0.193 |
|  | Low | 0.63 | 0.06 | 0.87 | 0.106 |
|  | N1 | 0.69 | 0.21 | 1.06 | 0.19 |
|  | N1EM | 0.65 | -0.01 | 0.59 | 0.179 |
|  | S | 0.78 | -0.66 | 0.35 | 0.196 |
| IVDMD | All | 0.56 | -0.01 | 0.95 | 0.05 |
|  | K | 0.46 | 0.38 | 0.36 | 0.162 |
|  | KxS | 0.56 | -0.28 | 0.59 | 0.205 |
|  | Low | 0.5 | 0.19 | 0.66 | 0.089 |
|  | N1 | 0.54 | 0.45 | 0.49 | 0.224 |
|  | N1EM | 0.5 | 0.09 | 0.36 | 0.212 |
|  | S | 0.76 | -0.99 | 0.08 | 0.192 |
| NSC | All | 0.63 | 0 | 0.96 | 0.059 |
|  | K | 0.75 | 0.26 | 0.46 | 0.184 |
|  | KxS | 0.68 | -0.18 | 0.75 | 0.195 |
|  | Low | 0.65 | 0.12 | 0.76 | 0.098 |
|  | N1 | 0.75 | 0.21 | 0.83 | 0.225 |
|  | N1EM | 0.48 | 0.05 | 0.39 | 0.211 |
|  | S | 0.53 | 0.09 | 1.05 | 0.185 |
| NSCE | All | 0.66 | -0.01 | 0.95 | 0.057 |
|  | K | 0.75 | 0.28 | 0.37 | 0.209 |
|  | KxS | 0.72 | -0.13 | 0.83 | 0.176 |
|  | Low | 0.67 | 0.1 | 0.76 | 0.091 |
|  | N1 | 0.77 | 0.29 | 0.71 | 0.2 |
|  | N1EM | 0.49 | -0.03 | 0.57 | 0.177 |
|  | S | 0.55 | 0.19 | 1.15 | 0.203 |
| PCA | All | 0.47 | 0 | 0.99 | 0.043 |
|  | K | 0.39 | 0.44 | 0.38 | 0.19 |
|  | KxS | 0.58 | -0.05 | 0.64 | 0.208 |
|  | Low | 0.39 | 0.12 | 0.74 | 0.1 |
|  | N1 | 0.41 | 0.2 | 0.41 | 0.222 |
|  | N1EM | 0.35 | -0.07 | 1.06 | 0.173 |
|  | S | 0.65 | -0.12 | 0.95 | 0.226 |
| PPEN | All | 0.47 | 0.01 | 0.98 | 0.045 |
|  | K | 0.5 | -0.18 | 0.82 | 0.167 |
|  | KxS | 0.41 | 0.15 | 0.77 | 0.166 |
|  | Low | 0.47 | -0.14 | 0.76 | 0.096 |
|  | N1 | 0.56 | -0.04 | 0.72 | 0.185 |
|  | N1EM | 0.38 | -0.29 | 0.53 | 0.208 |
|  | S | 0.5 | 0.42 | 0.68 | 0.243 |
| PSOL | All | 0.67 | 0 | 0.94 | 0.067 |
|  | K | 0.82 | 0.23 | 0.44 | 0.202 |
|  | KxS | 0.64 | -0.11 | 0.81 | 0.175 |
|  | Low | 0.74 | 0.11 | 0.75 | 0.098 |
|  | N1 | 0.87 | 0.24 | 0.87 | 0.198 |
|  | N1EM | 0.54 | 0 | 0.31 | 0.167 |
|  | S | 0.49 | -0.08 | 0.89 | 0.208 |
| SC | All | 0.55 | -0.01 | 0.98 | 0.044 |
|  | K | 0.66 | 0.24 | 0.56 | 0.194 |
|  | KxS | 0.49 | -0.09 | 0.95 | 0.137 |
|  | Low | 0.59 | 0.07 | 0.88 | 0.09 |
|  | N1 | 0.66 | 0.3 | 0.77 | 0.184 |
|  | N1EM | 0.47 | -0.02 | 0.46 | 0.206 |
|  | S | 0.44 | -0.09 | 0.88 | 0.234 |
| SUC | All | 0.54 | 0 | 0.97 | 0.048 |
|  | K | 0.66 | 0.24 | 0.49 | 0.17 |
|  | KxS | 0.49 | -0.08 | 0.95 | 0.137 |
|  | Low | 0.58 | 0.11 | 0.8 | 0.109 |
|  | N1 | 0.67 | 0.22 | 0.91 | 0.171 |
|  | N1EM | 0.43 | 0.08 | 0.28 | 0.222 |
|  | S | 0.48 | -0.57 | 0.47 | 0.226 |
| UA | All | 0.63 | -0.01 | 0.92 | 0.062 |
|  | K | 0.51 | 0.09 | 0.49 | 0.194 |
|  | KxS | 0.59 | -0.24 | 0.46 | 0.247 |
|  | Low | 0.55 | 0.18 | 0.66 | 0.111 |
|  | N1 | 0.53 | 0.47 | 0.2 | 0.213 |
|  | N1EM | 0.62 | 0.09 | 0.91 | 0.168 |
|  | S | 0.95 | -1.11 | -0.01 | 0.251 |
| YLD | All | 0.63 | 0 | 0.88 | 0.046 |
|  | K | 0.9 | 0.75 | -0.19 | 0.231 |
|  | KxS | 0.6 | -0.36 | -0.25 | 0.219 |
|  | Low | 0.75 | 0.32 | 0.31 | 0.1 |
|  | N1 | 0.57 | 0.11 | 0.2 | 0.236 |
|  | N1EM | 0.81 | 0.45 | 0.17 | 0.215 |
|  | S | 0.29 | -0.93 | 0.27 | 0.3 |
| 1mean squared error2average intercept of the regression3standard deviation of the accuracy across folds and replicates |

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| Table S3: Sparse Partial Least Squares Regression statistics from 20 replicates of 5-fold CV.  |
| **TRAIT** | **POP** | **MSE1** | **INTER2** | **SLOPE** | **SDEV3** |
| ANT | All | 0.24 | 0.01 | 0.99 | 0.025 |
|  | K | 0.08 | 0.82 | 0.04 | 0.209 |
|  | KxS | 0.32 | -0.1 | 0.57 | 0.193 |
|  | Low | 0.16 | 0.08 | 0.86 | 0.069 |
|  | N1 | 0.21 | -0.09 | 1.19 | 0.167 |
|  | N1EM | 0.19 | 0.11 | 0.58 | 0.202 |
|  | S | 0.41 | -1.4 | 0.19 | 0.327 |
| ASH | All | 0.66 | 0.01 | 0.96 | 0.064 |
|  | K | 0.51 | -0.18 | 0.39 | 0.266 |
|  | KxS | 0.75 | 0.29 | 0.74 | 0.206 |
|  | Low | 0.46 | -0.16 | 0.64 | 0.103 |
|  | N1 | 0.42 | -0.21 | 0.53 | 0.183 |
|  | N1EM | 0.47 | -0.24 | 0.64 | 0.219 |
|  | S | 1.28 | 0.21 | 0.67 | 0.21 |
| AX | All | 0.67 | 0 | 0.98 | 0.06 |
|  | K | 0.55 | 0.63 | 3.05 | 0.183 |
|  | KxS | 0.68 | 0.11 | 0.55 | 0.251 |
|  | Low | 0.66 | -0.01 | 1.03 | 0.115 |
|  | N1 | 0.82 | -0.47 | -0.3 | 0.193 |
|  | N1EM | 0.63 | 0.9 | 3.02 | 0.212 |
|  | S | 0.71 | 0.42 | 0.6 | 0.27 |
| ETOH | All | 0.61 | 0 | 0.96 | 0.057 |
|  | K | 0.5 | 0.11 | 0.64 | 0.183 |
|  | KxS | 0.62 | -0.13 | 0.82 | 0.185 |
|  | Low | 0.58 | 0.12 | 0.75 | 0.121 |
|  | N1 | 0.73 | 0.22 | 0.88 | 0.253 |
|  | N1EM | 0.5 | 0.02 | 0.77 | 0.17 |
|  | S | 0.72 | -0.55 | 0.45 | 0.234 |
| FAT | All | 0.55 | -0.01 | 0.97 | 0.047 |
|  | K | 0.44 | 0.12 | 0.69 | 0.18 |
|  | KxS | 0.79 | -0.71 | 0.3 | 0.178 |
|  | Low | 0.42 | 0.05 | 0.95 | 0.088 |
|  | N1 | 0.37 | -0.16 | 1.41 | 0.151 |
|  | N1EM | 0.41 | 0.06 | 0.91 | 0.177 |
|  | S | 0.74 | -0.8 | -0.03 | 0.238 |
| FEST | All | 0.31 | 0 | 1.01 | 0.029 |
|  | K | 0.22 | 0.43 | 0.42 | 0.204 |
|  | KxS | 0.47 | -0.02 | 0.98 | 0.208 |
|  | Low | 0.25 | 0.02 | 0.99 | 0.103 |
|  | N1 | 0.29 | 0.05 | 0.93 | 0.204 |
|  | N1EM | 0.23 | -0.13 | 1.15 | 0.179 |
|  | S | 0.35 | 0 | 1.03 | 0.178 |
| FRU | All | 0.66 | 0 | 0.93 | 0.056 |
|  | K | 0.77 | 0.3 | 0.15 | 0.209 |
|  | KxS | 0.5 | -0.04 | 0.99 | 0.194 |
|  | Low | 0.75 | 0.17 | 0.63 | 0.113 |
|  | N1 | 0.88 | 0.38 | 0.69 | 0.207 |
|  | N1EM | 0.63 | 0.08 | 0.27 | 0.208 |
|  | S | 0.53 | -0.58 | 0.38 | 0.251 |
| GLCS | All | 0.61 | -0.01 | 0.94 | 0.059 |
|  | K | 0.7 | 0.39 | 0.01 | 0.183 |
|  | KxS | 0.57 | -0.09 | 0.86 | 0.204 |
|  | Low | 0.62 | 0.26 | 0.43 | 0.099 |
|  | N1 | 0.65 | 0.45 | 0.42 | 0.192 |
|  | N1EM | 0.53 | 0.15 | 0.35 | 0.193 |
|  | S | 0.61 | -0.22 | 0.79 | 0.198 |
| GRN | All | 0.23 | -0.01 | 1.01 | 0.018 |
|  | K | 0.2 | 1.43 | -1.13 | 0.254 |
|  | KxS | 0.33 | -0.76 | 0.1 | 0.22 |
|  | Low | 0.19 | 0.15 | 0.86 | 0.12 |
|  | N1 | 0.23 | -0.64 | 2.27 | 0.178 |
|  | N1EM | 0.14 | 0.74 | -0.28 | 0.213 |
|  | S | 0.31 | -0.6 | 0.54 | 0.325 |
| HEX | All | 0.41 | -0.01 | 0.97 | 0.039 |
|  | K | 0.42 | 0.22 | 0.61 | 0.224 |
|  | KxS | 0.47 | -0.14 | 0.79 | 0.18 |
|  | Low | 0.35 | 0.31 | 0.45 | 0.101 |
|  | N1 | 0.33 | 0.35 | 0.24 | 0.22 |
|  | N1EM | 0.27 | 0.38 | 0.5 | 0.214 |
|  | S | 0.53 | -0.41 | 0.72 | 0.232 |
| HEXE | All | 0.59 | -0.01 | 0.96 | 0.06 |
|  | K | 0.49 | 0.15 | 0.6 | 0.222 |
|  | KxS | 0.65 | -0.22 | 0.77 | 0.228 |
|  | Low | 0.45 | 0.17 | 0.66 | 0.104 |
|  | N1 | 0.43 | 0.22 | 0.5 | 0.193 |
|  | N1EM | 0.44 | 0.24 | 0.63 | 0.179 |
|  | S | 0.97 | -0.32 | 0.7 | 0.212 |
| HEXEP | All | 0.67 | 0 | 0.94 | 0.061 |
|  | K | 0.57 | 0.14 | 0.46 | 0.175 |
|  | KxS | 0.68 | -0.08 | 0.76 | 0.191 |
|  | Low | 0.64 | 0.07 | 0.85 | 0.115 |
|  | N1 | 0.72 | 0.21 | 1.08 | 0.213 |
|  | N1EM | 0.64 | -0.09 | 0.83 | 0.178 |
|  | S | 0.78 | -0.69 | 0.31 | 0.216 |
| IVDMD | All | 0.55 | 0 | 0.96 | 0.053 |
|  | K | 0.44 | 0.27 | 0.53 | 0.172 |
|  | KxS | 0.57 | -0.3 | 0.57 | 0.203 |
|  | Low | 0.48 | 0.12 | 0.8 | 0.085 |
|  | N1 | 0.54 | 0.44 | 0.51 | 0.206 |
|  | N1EM | 0.47 | 0.02 | 0.59 | 0.2 |
|  | S | 0.75 | -0.89 | 0.19 | 0.172 |
| NSC | All | 0.65 | 0 | 0.94 | 0.061 |
|  | K | 0.76 | 0.32 | 0.35 | 0.185 |
|  | KxS | 0.69 | -0.18 | 0.72 | 0.212 |
|  | Low | 0.67 | 0.13 | 0.75 | 0.099 |
|  | N1 | 0.76 | 0.11 | 1.04 | 0.207 |
|  | N1EM | 0.47 | -0.01 | 0.53 | 0.222 |
|  | S | 0.54 | -0.21 | 0.74 | 0.191 |
| NSCE | All | 0.68 | -0.01 | 0.94 | 0.058 |
|  | K | 0.77 | 0.42 | 0.1 | 0.217 |
|  | KxS | 0.74 | -0.12 | 0.78 | 0.198 |
|  | Low | 0.68 | 0.1 | 0.76 | 0.093 |
|  | N1 | 0.8 | 0.28 | 0.78 | 0.189 |
|  | N1EM | 0.5 | -0.08 | 0.64 | 0.18 |
|  | S | 0.59 | -0.18 | 0.76 | 0.227 |
| PCA | All | 0.46 | 0 | 1.01 | 0.044 |
|  | K | 0.37 | 0.33 | 0.58 | 0.22 |
|  | KxS | 0.57 | -0.08 | 0.64 | 0.214 |
|  | Low | 0.37 | 0.02 | 0.96 | 0.099 |
|  | N1 | 0.41 | 0.26 | 0.28 | 0.199 |
|  | N1EM | 0.33 | -0.19 | 1.3 | 0.179 |
|  | S | 0.63 | -0.11 | 0.95 | 0.234 |
| PPEN | All | 0.49 | 0.01 | 0.96 | 0.047 |
|  | K | 0.51 | -0.23 | 0.74 | 0.209 |
|  | KxS | 0.43 | 0.2 | 0.66 | 0.157 |
|  | Low | 0.49 | -0.21 | 0.61 | 0.099 |
|  | N1 | 0.58 | -0.16 | 0.53 | 0.171 |
|  | N1EM | 0.38 | -0.29 | 0.5 | 0.209 |
|  | S | 0.51 | 0.68 | 0.48 | 0.249 |
| PSOL | All | 0.67 | 0 | 0.95 | 0.07 |
|  | K | 0.84 | 0.32 | 0.25 | 0.232 |
|  | KxS | 0.64 | -0.09 | 0.77 | 0.18 |
|  | Low | 0.75 | 0.1 | 0.76 | 0.099 |
|  | N1 | 0.9 | 0.2 | 0.99 | 0.183 |
|  | N1EM | 0.53 | -0.04 | 0.41 | 0.183 |
|  | S | 0.5 | -0.26 | 0.7 | 0.207 |
| SC | All | 0.56 | -0.01 | 0.98 | 0.048 |
|  | K | 0.68 | 0.34 | 0.41 | 0.206 |
|  | KxS | 0.5 | -0.08 | 0.93 | 0.149 |
|  | Low | 0.61 | 0.04 | 0.94 | 0.097 |
|  | N1 | 0.66 | 0.22 | 0.92 | 0.171 |
|  | N1EM | 0.46 | -0.07 | 0.58 | 0.214 |
|  | S | 0.45 | -0.27 | 0.71 | 0.245 |
| SUC | All | 0.55 | 0 | 0.97 | 0.05 |
|  | K | 0.69 | 0.42 | 0.16 | 0.182 |
|  | KxS | 0.5 | -0.07 | 0.91 | 0.142 |
|  | Low | 0.59 | 0.11 | 0.81 | 0.113 |
|  | N1 | 0.67 | 0.13 | 1.06 | 0.167 |
|  | N1EM | 0.42 | 0.04 | 0.37 | 0.237 |
|  | S | 0.5 | -0.74 | 0.31 | 0.222 |
| UA | All | 0.62 | 0 | 0.92 | 0.063 |
|  | K | 0.53 | 0.15 | 0.25 | 0.218 |
|  | KxS | 0.59 | -0.23 | 0.47 | 0.231 |
|  | Low | 0.55 | 0.15 | 0.71 | 0.105 |
|  | N1 | 0.5 | 0.4 | 0.32 | 0.204 |
|  | N1EM | 0.6 | 0.04 | 0.95 | 0.12 |
|  | S | 0.96 | -1.03 | 0.07 | 0.232 |
| YLD | All | 0.58 | 0 | 0.99 | 0.043 |
|  | K | 0.87 | -1.22 | 4.25 | 0.241 |
|  | KxS | 0.46 | -0.14 | 0.56 | 0.201 |
|  | Low | 0.71 | -0.12 | 1.27 | 0.11 |
|  | N1 | 0.56 | 0.79 | -1.34 | 0.204 |
|  | N1EM | 0.73 | 0.56 | -0.1 | 0.206 |
|  | S | 0.22 | -0.64 | 0.49 | 0.309 |
| 1mean squared error2average intercept of the regression3standard deviation of the accuracy across folds and replicates |

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| Table S4: BayesB Regression statistics from 5-fold CV. Using 5000 iterations and a 1500 iteration burn-in period (see Methods Section). |
| **TRAIT** | **POP** | **MSE1** | **INTER2** | **SLOPE** | **SDEV3** |
| YLD | all | 0.6 | 0.04 | 1.03 | 0.044 |
|  | Low | 0.66 | 0.4 | 1.16 | 0.159 |
|  | KxS | 0.55 | -0.3 | -0.14 | 0.201 |
|  | N1 | 0.52 | 0.37 | 0.71 | 0.267 |
|  | K | 0.8 | 0.49 | 1.15 | 0.309 |
|  | N1EM | 0.67 | 0.41 | 1.02 | 0.156 |
|  | S | 0.22 | -1.02 | 0.18 | 0.29 |
| ANT | all | 0.24 | 0.02 | 1.06 | 0.017 |
|  | Low | 0.19 | 0.41 | 1.25 | 0.07 |
|  | KxS | 0.29 | -0.24 | 0.61 | 0.28 |
|  | N1 | 0.24 | 0.5 | 1.58 | 0.286 |
|  | K | 0.08 | 0.76 | -0.34 | 0.297 |
|  | N1EM | 0.21 | 0.3 | 0.94 | 0.112 |
|  | S | 0.34 | -1.4 | 0.52 | 0.149 |
| GRN | all | 0.22 | 0.02 | 1.01 | 0.019 |
|  | Low | 0.21 | 0.63 | 0.12 | 0.15 |
|  | KxS | 0.3 | -0.77 | -0.64 | 0.255 |
|  | N1 | 0.24 | 0.68 | -0.34 | 0.243 |
|  | K | 0.23 | 0.61 | 1.03 | 0.137 |
|  | N1EM | 0.15 | 0.58 | -0.10 | 0.296 |
|  | S | 0.22 | 0.02 | 0.30 | 0.019 |
| IVDMD | all | 0.51 | 0 | 0.94 | 0.025 |
|  | Low | 0.47 | 0.43 | 0.93 | 0.085 |
|  | KxS | 0.56 | -0.4 | 0.85 | 0.298 |
|  | N1 | 0.51 | 0.47 | 0.85 | 0.141 |
|  | K | 0.49 | 0.61 | 0.20 | 0.234 |
|  | N1EM | 0.45 | 0.31 | 0.71 | 0.12 |
|  | S | 0.65 | -1.09 | 0.03 | 0.197 |
| FAT | all | 0.55 | -0.05 | 1.11 | 0.037 |
|  | Low | 0.43 | 0.44 | 1.05 | 0.138 |
|  | KxS | 0.79 | -0.78 | 0.61 | 0.361 |
|  | N1 | 0.44 | 0.44 | 1.19 | 0.125 |
|  | K | 0.41 | 0.34 | 0.73 | 0.2 |
|  | N1EM | 0.44 | 0.46 | 1.42 | 0.107 |
|  | S | 0.82 | -0.73 | 0.23 | 0.101 |
| ASH | all | 0.69 | -0.01 | 1.17 | 0.055 |
|  | Low | 0.51 | -0.41 | 0.33 | 0.039 |
|  | KxS | 0.79 | 0.46 | 0.76 | 0.16 |
|  | N1 | 0.38 | -0.4 | 0.52 | 0.246 |
|  | K | 0.45 | -0.33 | 0.69 | 0.266 |
|  | N1EM | 0.47 | -0.45 | 1.06 | 0.141 |
|  | S | 1.02 | 0.82 | 0.06 | 0.235 |
| UA | all | 0.62 | 0.02 | 0.99 | 0.084 |
|  | Low | 0.53 | 0.36 | 1.02 | 0.08 |
|  | KxS | 0.56 | -0.39 | 0.66 | 0.248 |
|  | N1 | 0.52 | 0.32 | 1.38 | 0.231 |
|  | K | 0.56 | 0.37 | 0.52 | 0.225 |
|  | N1EM | 0.7 | 0.44 | 1.92 | 0.249 |
|  | S | 0.59 | -1.01 | 0.34 | 0.209 |
| PCA | all | 0.41 | -0.03 | 1.01 | 0.037 |
|  | Low | 0.41 | 0.43 | 0.76 | 0.146 |
|  | KxS | 0.48 | -0.24 | 0.63 | 0.258 |
|  | N1 | 0.42 | 0.46 | 0.95 | 0.34 |
|  | K | 0.32 | 0.49 | 0.51 | 0.188 |
|  | N1EM | 0.45 | 0.4 | 1.87 | 0.121 |
|  | S | 0.55 | -1.26 | 0.5 | 0.455 |
| FEST | all | 0.32 | 0.02 | 0.96 | 0.02 |
|  | Low | 0.26 | 0.52 | 1.03 | 0.081 |
|  | KxS | 0.36 | -0.42 | 0.85 | 0.064 |
|  | N1 | 0.27 | 0.5 | 1.67 | 0.147 |
|  | K | 0.18 | 0.53 | 0.81 | 0.202 |
|  | N1EM | 0.27 | 0.44 | 0.74 | 0.176 |
|  | S | 0.38 | -1.13 | 1.09 | 0.189 |
| AX | all | 0.66 | 0 | 0.85 | 0.068 |
|  | Low | 0.7 | -0.38 | 0.14 | 0.097 |
|  | KxS | 0.63 | 0.21 | 0.70 | 0.055 |
|  | N1 | 0.72 | -0.34 | 2.17 | 0.081 |
|  | K | 0.45 | -0.41 | 0.67 | 0.057 |
|  | N1EM | 0.57 | -0.28 | 0.72 | 0.126 |
|  | S | 0.71 | 1.02 | 0.12 | 0.372 |
| SUC | all | 0.52 | 0.01 | 1.06 | 0.023 |
|  | Low | 0.51 | 0.43 | 1.14 | 0.07 |
|  | KxS | 0.49 | -0.34 | 1.39 | 0.165 |
|  | N1 | 0.64 | 0.48 | 0.37 | 0.283 |
|  | K | 0.68 | 0.5 | 0.58 | 0.112 |
|  | N1EM | 0.55 | 0.31 | -0.44 | 0.281 |
|  | S | 0.4 | -0.96 | 0.33 | 0.325 |
| GLCS | all | 0.45 | 0.05 | 1.08 | 0.031 |
|  | Low | 0.53 | 0.44 | 0.71 | 0.116 |
|  | KxS | 0.55 | -0.31 | 1.65 | 0.095 |
|  | N1 | 0.7 | 0.46 | 1.41 | 0.095 |
|  | K | 0.75 | 0.41 | 1.37 | 0.148 |
|  | N1EM | 0.74 | 0.38 | 0.39 | 0.202 |
|  | S | 0.51 | -0.89 | 0.95 | 0.181 |
| FRU | all | 0.76 | -0.02 | 1.04 | 0.096 |
|  | Low | 0.85 | 0.35 | 0.66 | 0.101 |
|  | KxS | 0.65 | -0.28 | 1.96 | 0.122 |
|  | N1 | 0.94 | 0.43 | 0.19 | 0.193 |
|  | K | 0.82 | 0.44 | -0.11 | 0.235 |
|  | N1EM | 0.55 | 0.31 | 0.53 | 0.26 |
|  | S | 0.54 | -0.88 | 0.83 | 0.043 |
| SC | all | 0.56 | -0.01 | 0.97 | 0.042 |
|  | Low | 0.57 | 0.4 | 1.17 | 0.08 |
|  | KxS | 0.56 | -0.33 | 1.25 | 0.159 |
|  | N1 | 0.63 | 0.5 | 0.56 | 0.098 |
|  | K | 0.62 | 0.54 | 1.37 | 0.101 |
|  | N1EM | 0.41 | 0.23 | 0.86 | 0.271 |
|  | S | 0.43 | -1 | 0.32 | 0.197 |
| ETOH | all | 0.62 | 0 | 0.99 | 0.038 |
|  | Low | 0.66 | 0.42 | 0.73 | 0.136 |
|  | KxS | 0.66 | -0.35 | 1.51 | 0.069 |
|  | N1 | 0.7 | 0.39 | 1.69 | 0.288 |
|  | K | 0.41 | 0.41 | 1.03 | 0.286 |
|  | N1EM | 0.65 | 0.36 | 0.88 | 0.069 |
|  | S | 0.81 | -1.01 | 0.42 | 0.28 |
| HEX | all | 0.4 | -0.01 | 1.03 | 0.047 |
|  | Low | 0.29 | 0.51 | 0.95 | 0.095 |
|  | KxS | 0.47 | -0.4 | 0.46 | 0.07 |
|  | N1 | 0.41 | 0.51 | 0.86 | 0.187 |
|  | K | 0.53 | 0.5 | 1.04 | 0.129 |
|  | N1EM | 0.26 | 0.55 | 0.46 | 0.325 |
|  | S | 0.52 | -1.11 | 0.91 | 0.179 |
| PPEN | all | 0.41 | -0.03 | 0.99 | 0.046 |
|  | Low | 0.45 | -0.44 | 1.29 | 0.044 |
|  | KxS | 0.39 | 0.43 | 0.40 | 0.293 |
|  | N1 | 0.55 | -0.43 | 1.13 | 0.118 |
|  | K | 0.48 | -0.46 | 2.23 | 0.124 |
|  | N1EM | 0.35 | -0.48 | 0.75 | 0.151 |
|  | S | 0.44 | 1.09 | 0.24 | 0.318 |
| HEXE | all | 0.61 | 0.02 | 0.91 | 0.041 |
|  | Low | 0.38 | 0.41 | 1.00 | 0.168 |
|  | KxS | 0.56 | -0.38 | 1.44 | 0.176 |
|  | N1 | 0.39 | 0.47 | 0.24 | 0.107 |
|  | K | 0.42 | 0.37 | 1.12 | 0.249 |
|  | N1EM | 0.39 | 0.47 | 0.98 | 0.219 |
|  | S | 1.1 | -1.02 | 1.91 | 0.12 |
| HEXEP | all | 0.7 | 0.02 | 0.89 | 0.04 |
|  | Low | 0.79 | 0.32 | 1.02 | 0.079 |
|  | KxS | 0.81 | -0.26 | 0.64 | 0.178 |
|  | N1 | 0.89 | 0.42 | 1.41 | 0.249 |
|  | K | 0.52 | 0.38 | 0.78 | 0.163 |
|  | N1EM | 0.73 | 0.25 | 0.82 | 0.188 |
|  | S | 0.65 | -0.94 | 0.13 | 0.144 |
| NSC | all | 0.68 | 0 | 0.96 | 0.041 |
|  | Low | 0.64 | 0.38 | 1.26 | 0.084 |
|  | KxS | 0.59 | -0.27 | 1.08 | 0.155 |
|  | N1 | 0.7 | 0.45 | 0.68 | 0.14 |
|  | K | 0.58 | 0.48 | 1.50 | 0.228 |
|  | N1EM | 0.4 | 0.23 | 0.86 | 0.19 |
|  | S | 0.64 | -1.04 | 0.21 | 0.31 |
| PSOL | all | 0.73 | -0.01 | 1.00 | 0.093 |
|  | Low | 0.68 | 0.36 | 0.85 | 0.073 |
|  | KxS | 0.61 | -0.31 | 1.22 | 0.292 |
|  | N1 | 0.96 | 0.4 | 1.20 | 0.089 |
|  | K | 0.95 | 0.51 | 0.15 | 0.127 |
|  | N1EM | 0.53 | 0.26 | 0.51 | 0.182 |
|  | S | 0.79 | -0.91 | 1.20 | 0.14 |
| NSCE | all | 0.72 | 0.01 | 1.12 | 0.071 |
|  | Low | 0.73 | 0.35 | 0.76 | 0.079 |
|  | KxS | 0.69 | -0.33 | 1.35 | 0.14 |
|  | N1 | 0.77 | 0.43 | 0.58 | 0.2 |
|  | K | 0.76 | 0.46 | 0.69 | 0.191 |
|  | N1EM | 0.55 | 0.26 | 0.56 | 0.266 |
|  | S | 0.63 | -0.81 | 0.58 | 0.291 |
| 1mean squared error |
| 2average intercept of the regression |
| 3standard deviation of the accuracy across folds and replicates |

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| Table S5: Variance components for selected traits after partitioning based on dominant principal components 1-3. |
| **Trait** | **aσg2** | **σe2** | **σgA2** | **σgW2** |
| ANT | 0.223 | 0.063 | 0.172 | 0.051 |
| ASH | 0.088 | 0.106 | 0.034 | 0.054 |
| AX | 0.144 | 0.061 | 0.105 | 0.039 |
| ETOH | 0.222 | 0.051 | 0.113 | 0.109 |
| FAT | 0.074 | 0.068 | 0.038 | 0.036 |
| FEST | 0.193 | 0.098 | 0.125 | 0.068 |
| FRU | 0.189 | 0.015 | 0.122 | 0.067 |
| GLCS | 0.19 | 0.084 | 0.119 | 0.071 |
| GRN | 0.225 | 0.016 | 0.205 | 0.020 |
| HEX | 0.148 | 0.06 | 0.111 | 0.037 |
| HEXE | 0.097 | 0.077 | 0.054 | 0.043 |
| HEXEP | 0.111 | 0.054 | 0.054 | 0.057 |
| IVDMD | 0.121 | 0.036 | 0.077 | 0.044 |
| NSC | 0.245 | 0.055 | 0.11 | 0.135 |
| NSCE | 0.207 | 0.06 | 0.081 | 0.126 |
| PCA | 0.151 | 0.107 | 0.088 | 0.063 |
| PPEN | 0.207 | 0.058 | 0.14 | 0.067 |
| PSOL | 0.234 | 0.045 | 0.106 | 0.128 |
| SC | 0.238 | 0.07 | 0.122 | 0.116 |
| SUC | 0.197 | 0.061 | 0.117 | 0.08 |
| UA | 0.096 | 0.042 | 0.066 | 0.03 |
| YLD | 0.077 | 0.021 | 0.072 | 0.006 |
| aGenetic variance, **σg2**; residual variance, **σe2**; across-population genetic variance, **σgA2**; within-population genetic variance **σgW2**. |

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| Table S6: ANOVA of factors influencing prediction accuracy. |
| **Source of variation** | **aDf** | **p-values** |
| Population | 6 | <0.0001 |
| Trait | 21 | <0.0001 |
| Method | 3 | 0.01 |
| Population x Trait | 126 | <0.0001 |
| Population x method | 18 | <0.0001 |
| Trait x Method | 63 | <0.0001 |
| Residuals | 378 |  |
| aDegrees of Freedom |