Figure S1. (a) Distribution of the expression level of the gene CEL16 relative to the housekeeping gene Actin across all 509 inbreds ordered by the gene expression level. (b) Violinplot of the gene expression level of CEL16 for the eight different germplasm types and (c) for the three MCLUST groups. (d) P-value profile from genome-wide association mapping for the gene expression level of the CEL16 gene for all 509 inbreds, (e) for the inbreds of the MCLUST group 1, (f) for the inbreds of the MCLUST group 2, and (g) for the inbreds of the MCLUST group 3. The x-axis shows physical map positions of the SNPs along the 19 chromosomes, the y-axis gives the $-\log_{10}$ P-value of the association test. The horizontal dashed and dotted lines indicate the $\alpha = 0.0001$ threshold and the threshold after Bonferroni correction ($\alpha=0.05$), respectively.
Figure S2. (a) Distribution of the expression level of the gene FBP relative to the housekeeping gene Actin across all 509 inbreds ordered by the gene expression level. (b) Violinplot of the gene expression level of FBP for the eight different germplasm types and (c) for the three MCLUST groups. (d) P-value profile from genome-wide association mapping for the gene expression level of the FBP gene for all 509 inbreds, (e) for the inbreds of the MCLUST group 1, (f) for the inbreds of the MCLUST group 2, and (g) for the inbreds of the MCLUST group 3. The x-axis shows physical map positions of the SNPs along the 19 chromosomes, the y-axis gives the -log_{10} P-value of the association test. The horizontal dashed and dotted lines indicate the α = 0.0001 threshold and the threshold after Bonferroni correction (α=0.05), respectively.
Figure S3. (a) Distribution of the expression level of the gene SPS relative to the housekeeping gene Actin across all 509 inbreds ordered by the gene expression level. (b) Violinplot of the gene expression level of SPS for the eight different germplasm types and (c) for the three MCLUST groups. (d) P-value profile from genome-wide association mapping for the gene expression level of the SPS gene for all 509 inbreds, (e) for the inbreds of the MCLUST group 1, (f) for the inbreds of the MCLUST group 2, and (g) for the inbreds of the MCLUST group 3. The x-axis shows physical map positions of the SNPs along the 19 chromosomes, the y-axis gives the -log₁₀ P-value of the association test. The horizontal dashed and dotted lines indicate the α = 0.0001 threshold and the threshold after Bonferroni correction (α=0.05), respectively.
Figure S4. (a) Distribution of the expression level of the gene PK relative to the housekeeping gene Actin across all 509 inbreds ordered by the gene expression level. (b) Violinplot of the gene expression level of PK for the eight different germplasm types and (c) for the three MCLUST groups. (d) P-value profile from genome-wide association mapping for the gene expression level of the PK gene for all 509 inbreds, (e) for the inbreds of the MCLUST group 1, (f) for the inbreds of the MCLUST group 2, and (g) for the inbreds of the MCLUST group 3. The x-axis shows physical map positions of the SNPs along the 19 chromosomes, the y-axis gives the -log_{10} P-value of the association test. The horizontal dashed and dotted lines indicate the α = 0.0001 threshold and the threshold after Bonferroni correction (α=0.05), respectively.
Figure S5. (a) Distribution of the expression level of the gene PECT relative to the housekeeping gene Actin across all 509 inbreds ordered by the gene expression level. (b) Violinplot of the gene expression level of PECT for the eight different germplasm types and (c) for the three MCLUST groups. (d) P-value profile from genome-wide association mapping for the gene expression level of the PECT gene for all 509 inbreds, (e) for the inbreds of the MCLUST group 1, (f) for the inbreds of the MCLUST group 2, and (g) for the inbreds of the MCLUST group 3. The x-axis shows physical map positions of the SNPs along the 19 chromosomes, the y-axis gives the -log_{10} P-value of the association test. The horizontal dashed and dotted lines indicate the α = 0.0001 threshold and the threshold after Bonferroni correction (α=0.05), respectively.
Figure S6. (a) Distribution of the expression level of the gene APL relative to the housekeeping gene Actin across all 509 inbreds ordered by the gene expression level. (b) Violinplot of the gene expression level of APL for the eight different germplasm types and (c) for the three MCLUST groups. (d) P-value profile from genome-wide association mapping for the gene expression level of the APL gene for all 509 inbreds, (e) for the inbreds of the MCLUST group 1, (f) for the inbreds of the MCLUST group 2, and (g) for the inbreds of the MCLUST group 3. The x-axis shows physical map positions of the SNPs along the 19 chromosomes, the y-axis gives the -log_{10} P-value of the association test. The horizontal dashed and dotted lines indicate the \( \alpha = 0.0001 \) threshold and the threshold after Bonferroni correction \( (\alpha=0.05) \), respectively.
Figure S7. (a) Distribution of the expression level of the gene AILP1 relative to the housekeeping gene Actin across all 509 inbreds ordered by the gene expression level. (b) Violinplot of the gene expression level of AILP1 for the eight different germplasm types and (c) for the three MCLUST groups. (d) P-value profile from genome-wide association mapping for the gene expression level of the AILP1 gene for all 509 inbreds, (e) for the inbreds of the MCLUST group 1, (f) for the inbreds of the MCLUST group 2, and (g) for the inbreds of the MCLUST group 3. The x-axis shows physical map positions of the SNPs along the 19 chromosomes, the y-axis gives the -log10 $P$-value of the association test. The horizontal dashed and dotted lines indicate the $\alpha = 0.0001$ threshold and the threshold after Bonferroni correction ($\alpha=0.05$), respectively.
Figure S8. (a) Distribution of the expression level of the gene GER1 relative to the housekeeping gene Actin across all 509 inbreds ordered by the gene expression level. (b) Violinplot of the gene expression level of GER1 for the eight different germplasm types and (c) for the three MCLUST groups. (d) $P$-value profile from genome-wide association mapping for the gene expression level of the GER1 gene for all 509 inbreds, (e) for the inbreds of the MCLUST group 1, (f) for the inbreds of the MCLUST group 2, and (g) for the inbreds of the MCLUST group 3. The x-axis shows physical map positions of the SNPs along the 19 chromosomes, the y-axis gives the $-\log_{10}$ $P$-value of the association test. The horizontal dashed and dotted lines indicate the $\alpha = 0.0001$ threshold and the threshold after Bonferroni correction ($\alpha=0.05$), respectively.
Figure S9. (a) Distribution of the expression level of the gene NOI relative to the housekeeping gene Actin across all 509 inbreds ordered by the gene expression level. (b) Violinplot of the gene expression level of NOI for the eight different germplasm types and (c) for the three MCLUST groups. (d) $P$-value profile from genome-wide association mapping for the gene expression level of the NOI gene for all 509 inbreds, (e) for the inbreds of the MCLUST group 1, (f) for the inbreds of the MCLUST group 2, and (g) for the inbreds of the MCLUST group 3. The x-axis shows physical map positions of the SNPs along the 19 chromosomes, the y-axis gives the $-\log_{10} P$-value of the association test. The horizontal dashed and dotted lines indicate the $\alpha = 0.0001$ threshold and the threshold after Bonferroni correction ($\alpha=0.05$), respectively.
Figure S10. (a) Distribution of the expression level of the gene MyAP relative to the housekeeping gene Actin across all 509 inbreds ordered by the gene expression level. (b) Violinplot of the gene expression level of MyAP for the eight different germplasm types and (c) for the three MCLUST groups. (d) P-value profile from genome-wide association mapping for the gene expression level of the MyAP gene for all 509 inbreds, (e) for the inbreds of the MCLUST group 1, (f) for the inbreds of the MCLUST group 2, and (g) for the inbreds of the MCLUST group 3. The x-axis shows physical map positions of the SNPs along the 19 chromosomes, the y-axis gives the $-\log_{10}$ P-value of the association test. The horizontal dashed and dotted lines indicate the $\alpha = 0.0001$ threshold and the threshold after Bonferroni correction ($\alpha=0.05$), respectively.
Figure S11. (a) Distribution of the expression level of the gene *GRF1* relative to the housekeeping gene *Actin* across all 509 inbreds ordered by the gene expression level. (b) Violinplot of the gene expression level of *GRF1* for the eight different germplasm types and (c) for the three MCLUST groups. (d) P-value profile from genome-wide association mapping for the gene expression level of the *GRF1* gene for all 509 inbreds, (e) for the inbreds of the MCLUST group 1, (f) for the inbreds of the MCLUST group 2, and (g) for the inbreds of the MCLUST group 3. The x-axis shows physical map positions of the SNPs along the 19 chromosomes, the y-axis gives the -log_{10} P-value of the association test. The horizontal dashed and dotted lines indicate the α = 0.0001 threshold and the threshold after Bonferroni correction (α=0.05), respectively.
Figure S12. (a) Distribution of the expression level of the gene VPS2 relative to the housekeeping gene Actin across all 509 inbreds ordered by the gene expression level. (b) Violinplot of the gene expression level of VPS2 for the eight different germplasm types and (c) for the three MCLUST groups. (d) P-value profile from genome-wide association mapping for the gene expression level of the VPS2 gene for all 509 inbreds, (e) for the inbreds of the MCLUST group 1, (f) for the inbreds of the MCLUST group 2, and (g) for the inbreds of the MCLUST group 3. The x-axis shows physical map positions of the SNPs along the 19 chromosomes, the y-axis gives the -log_{10} P-value of the association test. The horizontal dashed and dotted lines indicate the α = 0.0001 threshold and the threshold after Bonferroni correction (α=0.05), respectively.
**Figure S13.** (a) Distribution of the expression level of the gene *UBP15* relative to the housekeeping gene *Actin* across all 509 inbreds ordered by the gene expression level. (b) Violinplot of the gene expression level of *UBP15* for the eight different germplasm types and (c) for the three MCLUST groups. (d) P-value profile from genome-wide association mapping for the gene expression level of the *UBP15* gene for all 509 inbreds, (e) for the inbreds of the MCLUST group 1, (f) for the inbreds of the MCLUST group 2, and (g) for the inbreds of the MCLUST group 3. The x-axis shows physical map positions of the SNPs along the 19 chromosomes, the y-axis gives the -log_{10} P-value of the association test. The horizontal dashed and dotted lines indicate the $\alpha = 0.0001$ threshold and the threshold after Bonferroni correction ($\alpha=0.05$), respectively.
Figure S14. (a) Distribution of the expression level of the gene $GF14$ relative to the housekeeping gene $Actin$ across all 509 inbreds ordered by the gene expression level. (b) Violinplot of the gene expression level of $GF14$ for the eight different germplasm types and (c) for the three MCLUST groups. (d) $P$-value profile from genome-wide association mapping for the gene expression level of the $GF14$ gene for all 509 inbreds, (e) for the inbreds of the MCLUST group 1, (f) for the inbreds of the MCLUST group 2, and (g) for the inbreds of the MCLUST group 3. The x-axis shows physical map positions of the SNPs along the 19 chromosomes, the y-axis gives the $-\log_{10} P$-value of the association test. The horizontal dashed and dotted lines indicate the $\alpha = 0.0001$ threshold and the threshold after Bonferroni correction ($\alpha=0.05$), respectively.