



**Figure S6** LOD score profiles for the first four traits of the artificial bin analysis using the Lasso method, where the 12 chromosomes are separated by the dashed vertical lines and the permutation generated LOD score threshold for each trait is indicated by the dotted horizontal line. Three bins for KGW have LOD score larger than 16, but the plot is truncated at maximum 16. The LOD score thresholds for the four traits (YD, TP, GN and KGW) are 0.83, 0.85, 0.89 and 0.79, respectively.