

Description of Additional Supplementary Files

File Name: Supplementary Data 1

Description: SNP markers within 2000 base pairs upstream and downstream of the physical locations of 331 wheat *NPF* gene.

File Name: Supplementary Data 2

Description: Significant sites in CGAS of NUE-related agronomic traits in the years 2017-2020.

File Name: Supplementary Data 3

Description: List of SNPs associated with GAN and NAA identified by GWAS.

File Name: Supplementary Data 4

Description: Information of accessions used in genotyping of 15 significant sites and varieties name.

File Name: Supplementary Data 5

Description: Statistical analysis of NUE agronomic trait across 15 SNP markers in different genotyping groups.

File Name: Supplementary Data 6

Description: Allele composition of 20 wheat varieties and NUE-related phenotypic data from 2017 to 2021.

File Name: Supplementary Data 7

Description: The wheat transcription factors were collected by protein-DNA interactions predicted.

File Name: Supplementary Data 8

Description: *TaNPF7.6-A1^{mod}*-interacting candidate proteins identified by yeast two-hybrid screening.

File Name: Supplementary Data 9

Description: Germplasm description of the 1007 accessions used in this study.

File Name: Supplementary Data 10

Description: Origins and genotypes of *TaNPF7.6-A1* in Chinese wheat accessions.

File Name: Supplementary Data 11

Description: NPK nutrient status in the soil before sowing at two locations from 2017 to 2020 and 2023-2025.

File Name: Supplementary Data 12

Description: List of all the primers that were used in this study.

File Name: Supplementary Data 13

Description: The recipe of nutrient solution.