

The study and modification of wheat heading and maturity genes using genome approaches including CRISPR/Cas9 gene editing technology

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The key growth stages of wheat are heading and maturity. The dissection of genetic mechanisms and modification of these traits are important problems to improve plant adaptation and productivity.

In this work we used genome approaches to study genetics of heading and maturity which are to study allele variation and regulation of known genes and identification of novel loci and candidate genes for heading and maturity times. The most promising loci are on 4A, 5B, 6A, 6B, 7B chromosomes, where the most significant locus with highest effect is positioned on 7BL with *bZIP9* as best candidate gene.

Using the genome editing with CRISPR/Cas9 system we developed a collection of plants with different mutations in promoter of the *Ppd-1* genes, which is to study the regulation of their expression and effect on the vegetation period.

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Take-home message:

- The collection of *Ppd-1* mutants obtained in this work will be used to study the heading time genetic mechanisms in common wheat.
- A number of novel loci for heading and maturity time are identified and candidate genes are proposed.