

Effects of alleles of *Ppd-D1* and *Vrn-B3* genes on heading time and yield-related traits in spring common wheat

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The heading time in wheat is of great importance for adaptation to environmental conditions and grain yield. The spring common wheat varieties Tulun 15 and Obskaya 2 were selected for hybridization. Both varieties had the same alleles of the *Vrn-1* genes, however, the Tulun 15 variety had dominant *Ppd-D1a* and *Vrn-B3a* alleles, while the Obskaya 2 variety had recessive *Ppd-D1b* and *Vrn-B3b* alleles. Using allele-specific primers F₂ generation plants with different combinations of *VRN* and *PPD1* alleles were detected. The F₃₋₄ generation plants were sown in the field to study the alleles' effect of the *Ppd-D1* and *Vrn-B3* genes on the heading time and yield traits. The estimate showed that the heading time from early to late was distributed in plants containing the alleles: *Ppd-D1a* and *Vrn-B3a* → *Ppd-D1a* and *Vrn-B3b* → *Ppd-D1b* and *Vrn-B3a* → *Ppd-D1b* and *Vrn-B3b*. The yield-related traits were also evaluated: the number of grains per plant, the weight of grains per plant, the weight of 1000 grains, etc.

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Take-home message:

It was shown that the dominant allele *Ppd-D1a* has a stronger effect on the heading time of wheat than the dominant allele *Vrn-B3a*. The results obtained in this work can be used in the breeding of common wheat for heading time.