# The effects on grain quality traits of a grain serpin protein and the VPM 1 segment in southern Australian wheat breeding

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Identification and evaluation of alleles of genes impacting on wheat quality enables breeders to improve their germplasm by selection toward specific allele combinations. Using a large data set obtained from southern Australian wheat breeding programs, and including a relationship matrix in the analysis to minimise biases, we evaluated the effects of a defence grain protein, a serpin located on chromosome 5B, and the VPM1 alien segment on the grain quality parameters Rmax, dough extensibility, dough development time, flour water absorption and milling yield. The data spanned the period from 1983 to 2006 and included data from 899 lines in 545 environments. The serpin null allele significantly reduced milling yield by approximately 0.4g of flour per 100g of grain milled across different germplasm sources and flour protein levels. In Australian germplasm, the origin of this allele was traced to a 19th century introduction from India by William Farrer. However, other sources, of significance in international breeding programs, were also identified. Our analysis found no detrimental effects of the VPM1 alien segment on the quality traits we measured.