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► **To cite this version:**

Frédéric Choulet, Adriana A. Alberti, Sébastien Theil, Natasha Marie Glover, Valérie Barbe, et al.. A reference sequence of wheat chromosome 3B. 22. Conference on Plant and Animal Genome, Jan 2014, San Diego, United States. hal-02742303

HAL Id: hal-02742303

<https://hal.inrae.fr/hal-02742303v1>

Submitted on 3 Jun 2020

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Title: A Reference Sequence of Wheat Chromosome 3B

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Abstract: We produced a reference sequence of the hexaploid wheat chromosome 3B. We established a strategy that combined several technologies to sequence 8452 Bacterial Artificial Chromosomes pooled by 10 and were able to assemble a pseudomolecule of 774 Mb carrying 7264 protein-coding genes and 85% of transposable elements. Comparative genomics with model grasses revealed that wheat has recently undergone massive inter and intrachromosomal gene duplications. Distribution of both structural and functional features highlighted a striking compartmentalization. Chromosomal extremities, corresponding to regions where meiotic recombination takes place, are enriched in genes originating from recent duplication events, expressed in specific conditions, and with function related to adaptation, which contrasts with the features of the central region of the chromosome. Such reference sequence provides an important resource to support the identification of genes underlying important traits and novel insights into the organization, function and evolution of a complex polyploid genome.

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Choulet, F., Alberti, A., Theil, S., Glover, N. M., Barbe, V., Daron, J., Pingault, L., Sourdille, P., Couloux, A., Paux, E., Leroy, P., Mangenot, S., Guilhot, N., Le Gouis, J., Balfourier, F., Alaux, M., Jamilloux, V., Poulain, J., Duran, C., Bellec, A., Gaspin, C., Safar, J., Dolezel, J., Roder, J., Vandepoele, K., Aury, J.-M., Mayer, K., Bergès, H., Quesneville, P., Wincker,