



**Figure S4** Phenotype of the tetraploid wheat and barley TILLING lines. **(A)** Supernumerary spikelet formation at the wheat homozygous TILLING plant T4-2447-7 (Mutant). The donor cultivar is tetraploid wheat cv. Kronos (Wild type). The images at the far right showed ectopic branch formation (red arrows) at early stage of development of cv. Kronos (Wild type) and the T4-2447-7 (Mutant). **(B)** Branch formation of the two barley TILLING mutant plants derived from barley cv. Morex (Wild type). Branch formation showed a range of severity from formation of a small-sized secondary spike (red arrows) to an extended rachilla at the central spikelet (blue arrows).