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| **Supplementary Table 3: Summary of Tiller angle QTLs in different Models of GWAS**  |  |  |  |  |
| GWAS-QTL | Chrom-osome | Model-population | Peak SNP | -LOG10(*p*) of Peak SNPs in different models | Flanking SNPs |
| MLM in full pop. | GLM in full pop. | MLM in *ind.* | GLM in *ind.* | MLM in *jap.* | GLM in *jap.* | Right | Left |
| *qTA1-1* | 1 | MLM-GLM-whole | 22379048 | 4.95 | 5.29 | 1.21 | 2.34 | 1.14 | 1.13 | 21952887 | 22436318 |
| *qTA1-2* | 1 | MLM-GLM-whole | 24887286 | 4.61 | 5.78 | 2.43 | 3.98 | 0.00 | 0.00 | 24781381 | 25029148 |
| *qTA2-1* | 2 | MLM-GLM-whole | 829685 | 4.25 | 4.44 | 1.38 | 2.23 | 1.70 | 1.76 | 829685 | 870392 |
| *qTA2-2* | 2 | MLM-GLM-Jap | 8709646 | 0.21 | 0.02 | 0.71 | 0.65 | 4.84 | 5.00 | 8686587 | 8709646 |
| *qTA2-3* | 2 | GLM-ind | 16631825 | 3.55 | 3.49 | 0.75 | 4.56 | 0.00 | 0.00 | 16631825 | 16766562 |
| *qTA2-4* | 2 | MLM-whole | 18056292 | 5.26 | 5.27 | 0.00 | 2.29 | 2.26 | 2.29 | 17094194 | 18789028 |
| *qTA2-5* | 2 | GLM-ind | 18789028 | 4.44 | 5.14 | 2.44 | 5.61 | 0.00 | 0.00 | 18702054 | 18789028 |
| *qTA2-6* | 2 | MLM-ind | 29311370 | 0.86 | 0.90 | 4.42 | 0.57 | 0.00 | 0.00 | 29221199 | 29407400 |
| *qTA3-1* | 3 | MLM-whole | 25422986 | 5.27 | 4.19 | 0.96 | 3.32 | 1.31 | 1.42 | 25263068 | 25423816 |
| *qTA3-2* | 3 | MLM-whole | 26277666 | 4.47 | 3.41 | 1.59 | 2.66 | 1.15 | 1.23 | 26263239 | 26313715 |
| *qTA3-3* | 3 | GLM-whole | 33199574 | 3.35 | 4.36 | 2.71 | 2.83 | 0.00 | 0.00 | 33198645 | 33199696 |
| *qTA3-4* | 3 | GLM-jap | 35863137 | 0.83 | 1.03 | 0.00 | 0.00 | 4.45 | 4.55 | 35856297 | 35918334 |
| *qTA4-1* | 4 | GLM-whole | 723871 | 4.30 | 4.91 | 1.41 | 3.17 | 0.54 | 0.52 | 654721 | 724006 |
| *qTA4-2* | 4 | MLM-GLM-whole | 972323 | 4.49 | 4.23 | 3.04 | 5.52 | 0.66 | 0.67 | 921112 | 972402 |
| *qTA4-3* | 4 | GLM-whole | 1902732 | 2.61 | 4.42 | 1.98 | 1.97 | 1.61 | 1.71 | 1886204 | 1979550 |
| *qTA5-1* | 5 | MLM-ind | 17795916 | 1.82 | 1.33 | 5.01 | 2.15 | 0.80 | 0.77 | 17795916 | 18061792 |
| *qTA5-2* | 5 | MLM-ind | 18668045 | 1.28 | 0.83 | 4.73 | 1.58 | 0.64 | 0.62 | 18485378 | 18709357 |
| *qTA5-3* | 5 | MLM-ind | 19108377 | 0.87 | 0.55 | 4.43 | 1.73 | 0.51 | 0.52 | 19108377 | 19210385 |
| *qTA6* | 6 | MLM-ind | 26092692 | 1.64 | 1.20 | 4.52 | 3.26 | 0.75 | 0.84 | 26086626 | 26127844 |
| *qTA8-1* | 8 | MLM-ind | 20690040 | 1.51 | 1.70 | 4.78 | 1.49 | 0.00 | 0.00 | 20689044 | 20696741 |
| *qTA8-2* | 8 | GLM-whole | 20802316 | 3.91 | 5.94 | 2.37 | 3.41 | 0.00 | 0.00 | 20802316 | 20995468 |
| *qTA8-3* | 8 | MLM-ind | 28327637 | 0.40 | 0.37 | 4.38 | 1.73 | 0.00 | 0.00 | 28326448 | 28438469 |
| *qTA9-1* | 9 | GLM-jap | 1193941 | 1.31 | 0.64 | 0.00 | 0.00 | 4.08 | 4.15 | 1070773 | 1193941 |
| *qTA9-2* | 9 | MLM-GLM-Jap | 2070634 | 1.65 | 1.98 | 0.00 | 0.00 | 4.36 | 4.50 | 1313684 | 2207902 |
| *qTA9-3* | 9 | MLM-GLM-Jap | 2516331 | 1.84 | 2.24 | 0.63 | 0.00 | 4.67 | 4.80 | 2407587 | 2621693 |
| *qTA9-4* | 9 | MLM-GLM-Jap | 2980680 | 1.54 | 1.73 | 0.00 | 0.00 | 4.35 | 4.50 | 2936852 | 3180164 |
| *qTA9-5* | 9 | GLM-jap | 3383978 | 1.40 | 1.46 | 1.17 | 0.00 | 4.46 | 4.54 | 3383859 | 3486825 |
| *qTA9-6* | 9 | MLM-whole | 20739050 | 4.80 | 3.96 | 2.21 | 3.60 | 0.85 | 0.88 | 20721611 | 20749797 |
| *qTA10-1* | 10 | MLM-GLM-whole | 14414010 | 4.21 | 5.30 | 1.71 | 2.46 | 0.00 | 0.00 | 14191834 | 14733631 |
| *qTA10-2* | 10 | GLM-jap | 20273073 | 0.39 | 0.31 | 0.00 | 0.00 | 3.82 | 4.02 | 20268702 | 20295300 |
| *qTA10-3* | 10 | MLM-GLM-Jap | 22799648 | 0.97 | 1.03 | 0.88 | 0.55 | 4.53 | 4.69 | 22774612 | 22836250 |
| *qTA11-1* | 11 | GLM-whole | 4826905 | 2.69 | 4.70 | 1.86 | 1.61 | 0.00 | 0.00 | 4826905 | 4829616 |
| *qTA11-2* | 11 | GLM-ind | 13090765 | 2.29 | 2.62 | 2.89 | 4.30 | 0.69 | 0.72 | 13090765 | 13171938 |
| *qTA12-1* | 12 | MLM-ind | 3329842 | 1.24 | 1.22 | 4.66 | 1.72 | 0.00 | 0.00 | 3258584 | 3539326 |
| *qTA12-2* | 12 | MLM-ind | 9262194 | 1.98 | 2.10 | 4.22 | 2.16 | 0.81 | 0.84 | 9262194 | 9337250 |
| *qTA12-3* | 12 | MLM-ind | 9606800 | 1.37 | 1.05 | 4.72 | 2.52 | 0.00 | 0.00 | 9606800 | 9755631 |
| *qTA12-4* | 12 | MLM-GLM-whole | 21905686 | 5.37 | 5.15 | 1.70 | 3.39 | 0.49 | 0.53 | 21901194 | 22047563 |
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