**Supplemental file:**

**Table 1.** Least squares mean for agronomic traits of wheat cultivars released between1991 to 2012 under 75%FC and 45%FC in Southwest China

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cultivars | YOR | Plant height  (cm) | | Leaf water  Loss (%) | | Fertile tillers  per plant | | Spikelet  number | | Spike  Weight (g) | | Grain yield per plant  (g plant-1) | |
| 75%FC | 45FC | 75%FC | 45FC | 75%FC | 45FC | 75%FC | 45FC | 75%FC | 45FC | 75%FC | 45FC |
| Chuanyu12 | 1991 | 93.6 | 92.0 | 10.00 | 10.10 | 3.07 | 2.24 | 20.2 | 18.9 | 2.36 | 2.14 | 6.8 | 3.4 |
| Chuanmai30 | 1996 | 82.7 | 86.7 | 11.06 | 10.96 | 2.60 | 2.60 | 17.0 | 16.2 | 1.80 | 1.32 | 4.7 | 3.4 |
| Shuwan8 | 1998 | 114.5 | 113.0 | 9.87 | 10.50 | 2.40 | 2.85 | 18.8 | 18.4 | 2.13 | 2.05 | 5.1 | 5.8 |
| Chuannong16 | 2000 | 80.7 | 84.1 | 10.80 | 10.58 | 2.80 | 2.73 | 16.5 | 16.9 | 1.95 | 2.07 | 5.5 | 5.7 |
| Chuanmai41 | 2001 | 93.5 | 86.2 | 10.25 | 10.69 | 2.73 | 2.22 | 21.1 | 17.0 | 2.73 | 2.06 | 7.5 | 4.6 |
| Chuanmai39 | 2002 | 89.4 | 88.4 | 10.96 | 10.23 | 2.67 | 2.60 | 16.2 | 15.7 | 2.04 | 1.50 | 5.4 | 3.9 |
| Chuanmai43 | 2002 | 88.4 | 88.4 | 10.00 | 7.81 | 2.86 | 2.75 | 17.1 | 16.0 | 2.48 | 1.93 | 7.1 | 5.3 |
| Guinong19 | 2003 | 81.2 | 80.7 | 10.91 | 10.58 | 2.87 | 2.60 | 17.2 | 15.8 | 2.10 | 1.36 | 6.0 | 3.5 |
| Chuanmai44 | 2004 | 82.0 | 82.5 | 9.33 | 8.67 | 2.87 | 2.13 | 20.4 | 18.3 | 2.61 | 2.10 | 7.5 | 4.5 |
| Mianmai1403 | 2004 | 79.9 | 80.0 | 9.23 | 9.35 | 2.87 | 2.30 | 19.3 | 18.3 | 2.34 | 2.07 | 6.7 | 4.8 |
| Neimai9 | 2004 | 92.4 | 91.8 | 10.71 | 10.48 | 2.43 | 2.16 | 18.8 | 18.3 | 2.79 | 1.19 | 6.8 | 2.6 |
| Chuanyu23 | 2005 | 88.0 | 86.8 | 10.87 | 11.17 | 2.70 | 2.00 | 19.0 | 17.3 | 2.40 | 1.33 | 6.5 | 2.7 |
| Shumai482 | 2005 | 90.3 | 89.3 | 8.63 | 7.43 | 2.73 | 2.60 | 17.2 | 17.9 | 2.67 | 2.80 | 7.3 | 7.3 |
| Xikemai5 | 2005 | 85.7 | 83.3 | 9.32 | 9.55 | 2.57 | 2.53 | 18.9 | 18.8 | 2.80 | 2.35 | 7.2 | 6.0 |
| Chuanmai51 | 2006 | 104.1 | 95.2 | 10.26 | 10.18 | 2.87 | 2.67 | 18.6 | 17.5 | 2.66 | 1.76 | 7.6 | 4.7 |
| Mianzamai168 | 2006 | 92.5 | 92.3 | 10.00 | 11.06 | 3.18 | 2.53 | 19.4 | 17.6 | 2.90 | 2.29 | 9.2 | 5.8 |
| Neimai836 | 2006 | 89.6 | 85.3 | 10.66 | 10.57 | 2.53 | 1.87 | 19.1 | 17.4 | 2.62 | 1.24 | 6.6 | 3.2 |
| Neimai55 | 2007 | 83.8 | 83.1 | 10.53 | 9.96 | 2.57 | 2.13 | 19.5 | 18.9 | 2.76 | 2.03 | 7.1 | 4.3 |
| Yunnong27 | 2007 | 80.7 | 79.5 | 10.27 | 10.44 | 3.67 | 2.93 | 18.0 | 17.9 | 2.16 | 2.19 | 7.9 | 6.4 |
| Yunmai53 | 2007 | 101.4 | 95.2 | 10.48 | 10.75 | 2.60 | 2.93 | 18.6 | 18.3 | 2.66 | 2.02 | 6.9 | 5.9 |
| Mianmai367 | 2008 | 84.4 | 83.4 | 9.95 | 10.28 | 2.85 | 1.50 | 20.1 | 18.3 | 3.04 | 2.02 | 8.7 | 5.0 |
| Chuanmai62 | 2010 | 89.2 | 87.3 | 9.64 | 9.19 | 2.73 | 3.07 | 18.6 | 17.3 | 2.52 | 1.90 | 6.9 | 5.8 |
| Chuanmai65 | 2010 | 88.4 | 88.2 | 9.00 | 11.17 | 3.07 | 2.60 | 17.9 | 16.5 | 2.36 | 1.81 | 7.2 | 4.7 |
| Mianmai228 | 2010 | 84.5 | 77.9 | 7.08 | 7.27 | 3.48 | 3.30 | 18.2 | 17.4 | 2.27 | 1.86 | 7.9 | 6.1 |
| Naimai302 | 2010 | 76.1 | 75.7 | 8.00 | 11.77 | 3.07 | 2.13 | 19.9 | 19.8 | 2.24 | 2.51 | 6.9 | 5.4 |
| Cangmai34 | 2011 | 88.6 | 90.3 | 9.00 | 11.19 | 3.13 | 2.53 | 17.8 | 17.3 | 2.98 | 1.82 | 9.3 | 4.6 |
| Chuanmai63 | 2011 | 86.0 | 83.3 | 9.99 | 10.66 | 2.92 | 2.07 | 19.4 | 17.5 | 2.96 | 1.69 | 8.7 | 3.5 |
| Shumai51 | 2011 | 86.5 | 87.3 | 8.34 | 7.28 | 3.47 | 3.20 | 17.6 | 16.9 | 2.51 | 1.91 | 8.7 | 6.1 |
| Shumai53 | 2011 | 89.3 | 87.8 | 8.53 | 8.07 | 3.20 | 2.80 | 17.5 | 16.6 | 2.47 | 1.96 | 7.9 | 5.5 |
| Shumai969 | 2011 | 88.7 | 88.3 | 9.94 | 10.06 | 3.77 | 2.47 | 18.9 | 16.3 | 2.55 | 1.63 | 9.6 | 4.0 |
| Chuanmai104 | 2012 | 88.5 | 89.0 | 7.99 | 7.92 | 3.51 | 2.27 | 17.5 | 15.5 | 2.69 | 1.38 | 9.5 | 6.0 |

Note: The YOR represents the year of release.

**Table 2 Statistics of IlluminaHiSeq reads and comparison to wheat genome**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Samples | Raw Reads | Clean reads | Clean reads ratio | %≥Q30 | Mapped Reads | Mapping ratio |
| E0P0-1 | 135.7 | 135.6 | 99.86% | 91.38% | 86.7 | 63.93% |
| E0P1-1 | 101.6 | 101.4 | 99.85% | 91.63% | 62.8 | 61.94% |
| E1P0-1 | 106.1 | 105.4 | 99.35% | 94.76% | 67.9 | 64.37% |
| E1P1-1 | 117.9 | 116.1 | 98.48% | 95.34% | 75.5 | 64.98% |
| E0P0-12 | 86.9 | 86.8 | 99.87% | 91.63% | 54.0 | 62.17% |
| E0P1-12 | 148.8 | 148.5 | 99.77% | 90.86% | 93.5 | 62.94% |
| E1P0-12 | 79.5 | 79.3 | 99.86% | 91.37% | 50.6 | 63.82% |
| E1P1-12 | 104.4 | 104.2 | 99.84% | 91.43% | 68.0 | 65.20% |

**Table4** Primer used for validation of RNA Sequencing data by qRT-PCR

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| N0. | Gene ID | （5'-3 Primer sequence') | | | |
| 1 | Traes\_6BL\_A9E72E9F7 | F | TAGAGCGGTGGGTGAGTTGG | R | CGAAGCGGATGTAGGTGTAGGT |
| 2 | Traes\_1DL\_7646E144F | F | TTGTAGCCACCGAGGAAAGC | R | AGGAACAGTACCAGCAAACCG |
| 3 | Traes\_4DS\_CC45FE96E | F | TCGCCGCTGATCTTGTCCTT | R | AAGAAGGCGGAGGAGCACAA |
| 4 | Traes\_3B\_913263509 | F | GCTGTACGGCGAGAAGGAGT | R | CCAATGGTTTGCTTACCCTGA |
| 5 | Traes\_2DS\_6FA5738431 | F | GAACTTCCGGGACAGGCTCTA | R | GGTTGCGGTAGTATGCGTTGT |
| 6 | Traes\_2BL\_8CD42B820 | F | CCTGGAGCACATCGTGGAGT | R | GGGAAGCAGTCGTGGAAGAG |
| 7 | GAPDH | F | CAACATCATTCCAAGCAGCACT | R | GGAAACAAGGTCCTCATCAACG |