**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 |