

Appendix A. Locations, soil texture, local hybrids and ecological conditions of the experimental sites (Liu et al., 2015)

| Experimental sites | Locations | | Metro-ecological conditions | | | | | | Soil texture | Local hybrids | Planting years |
|--------------------|----------------|----------------|-----------------------------|------------------|--------------------------------|------------------------|-----------------------|--------------------------------|--------------|--------------------------------|-----------------|
| | North latitude | East longitude | ≥10 °C | | | Frostless duration (d) | Irrigation conditions | | | | |
| | | | Altitude (m) | temperature (°C) | Accumulated sunshine hours (h) | | | Accumulated Precipitation (mm) | | | |
| | | | | | | | | | | | |
| Wangkui, HLJ | 46°50' | 126°29' | 180 | 3047 | 2633 | 543 | 165 | Rainfed | Loam | Xingken3 | 2007-2008 |
| Qinggang, HLJ | 46°41' | 126°06' | 151 | 2912 | 2587 | 505 | 159 | Rainfed | Clay | Jidan261 | 2007-2008 |
| Zhaodong, HLJ | 46°03' | 125°59' | 148 | 3214 | 2903 | 431 | 164 | Rainfed | Loam | Shuoqiu8, Xianyu335 | 2007-2009 |
| Keshanxian, HLJ | 48°02' | 125°52' | 276 | 2844 | 2570 | 504 | 159 | Rainfed | Clay | Zhedan37, Kedan10, Kedan12 | 2010 |
| Qiqihaer, HLJ | 47°21' | 123°55' | 147 | 3185 | 2793 | 464 | 163 | Rainfed | Loam | Xingke3, Shuagnyu1, Jidan27 | 2009-2010, 2012 |
| | | | | | | | | | Clay | Kendan10 | 2008-2009, |
| Jiamusi, HLJ | 46°48' | 130°19' | 98 | 2994 | 2401 | 559 | 155 | Rainfed | | | 2011-2012 |
| Mudanjiang, HLJ | 44°33' | 129°38' | 306 | 3069 | 2322 | 514 | 159 | Rainfed | Loam | Mudan10, Xinyu2, Heyu19 | 2007-2010 |
| Hulan, HLJ | 45°52' | 126°36' | 130 | 3284 | 2193 | 524 | 174 | Rainfed | Loam | Xianuy335, Jidan 79, Yuyu23 | 2008-2010 |
| Qianguo, JL | 45°07' | 124°50' | 138 | 3356 | 2615 | 425 | 171 | Rainfed | Clay | Xianuy335 | 2007-2009 |
| Nongan, JL | 44°25' | 125°12' | 179 | 3392 | 2462 | 610 | 168 | Rainfed | Sandy loam | Xianuy335, Jidan79, Xianuy420 | 2007-2010 |
| Gongzhuling, JL | 43°30' | 124°51' | 215 | 3513 | 2479 | 580 | 171 | Rainfed | Clay | Shenyu20, Liangyu58 | 2007-2012 |
| Yitong, JL | 43°20' | 125°19' | 265 | 3392 | 2462 | 610 | 168 | Rainfed | Loam | Ketai2066, Danke208 | 2007-2008 |
| Siping, JL | 43°10' | 124°21' | 170 | 3513 | 2479 | 580 | 171 | Rainfed | Clay | Xianuy335 | 2007 |
| Jilinsi, JL | 43°50' | 126°33' | 221 | 3205 | 2125 | 717 | 156 | Rainfed | Sandy loam | Xianuy335, Jiudan48, Xianyu696 | 2009-2012 |
| Tonghua, JL | 41°44' | 125°57' | 457 | 3149 | 2397 | 722 | 168 | Rainfed | Sandy | Xianuy335, Tonghua24 | 2009-2012 |
| Kangping, LN | 42°45' | 123°21' | 98 | 3572 | 2513 | 722 | 167 | Rainfed | Loam | Danyu39, Shenyu21, Tieyan124 | 2007-2010 |

| | | | | | | | | | | | |
|-----------------|--------|---------|------|------|------|------|-----|---------|-------|---------------------------------|-----------------|
| Zhangwu, LN | 42°23' | 122°33' | 102 | 3651 | 2565 | 545 | 177 | Rainfed | Sandy | Xianuy335, KS3564, Beiyu288 | 2007-2010, 2012 |
| | | | | | | | | | Loam | Danyu39, Liaodan565, Liaodan527 | 2007-2008, |
| Shenyang, LN | 41°48' | 123°26' | 53 | 3696 | 2382 | 711 | 180 | Rainfed | | | 2011-2012 |
| Haicheng, LN | 40°53' | 122°41' | 25 | 4149 | 2593 | 769 | 205 | Rainfed | Sandy | Liaodan565, Liangyu88, Danyu202 | 2007-2010 |
| Jinzhou, LN | 41°06' | 121°07' | 40 | 4009 | 2532 | 605 | 205 | Rainfed | Loam | Jin1021 | 2009 |
| Dandong, LN | 40°08' | 124°23' | 45 | 3571 | 2287 | 1062 | 202 | Rainfed | Loam | Danyu39, Danyu202, Danyu603 | 2009-2010, 2012 |
| Tieling, LN | 42°17' | 123°51' | 65 | 3572 | 2513 | 722 | 167 | Rainfed | Loam | Danyu39, Teyan124, Shenyu21 | 2009-2010 |
| Zunhua, HB | 40°12' | 117°58' | 205 | 4382 | 2459 | 658 | 215 | Rainfed | Loam | Dongdan60, Zunyan2, Chiyu2 | 2008-2012 |
| Zhangjiakou, HB | 40°45' | 114°55' | 1350 | 3701 | 2588 | 388 | 194 | Rainfed | Loam | Xuntian2008, Hengdan11 | 2009-2010 |

*Mean values of meteorological annual variables over a period of 10 years (2003–2012) were obtained from the nearest meteorological stations in different provinces in China (HLJ: Heilongjiang; JL: Jilin; LN: Liaoning; HB: Hebei).