Appendix S1. Description of the data used. SC = sole crop; IC = intercrop; N = nitrogen

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Intercropped species (cereal – legume)** | **Site** | **Year**  | **No. genotypes (cereal - legume)** | **IC spatial pattern** | **Intercrop density (% of the sole crop)** | **N-treatments (in addition to N0 for all experiments and modalities)**  | **References** |
| Spring barley – faba bean | Denmark, Copenhagen | 2001 | 2 - 1 | within-row | 0.5 - 0.5  | 1 N-treatment for barley in SC (50 kg N.ha-1) | (Knudsen et al., 2004; Hauggaard-Nielsen et al., 2008) |
| Denmark, Jyndevad | 2001, 2002, 2003 |
| Spring barley - pea | Denmark, Copenhagen | 2001 | 2 - 2 | within-row | 0.5 - 0.5  | 1 N-treatment for barley in SC (50 kg N.ha-1) | (Knudsen et al., 2004; Hauggaard-Nielsen et al., 2008) |
| Denmark, Jyndevad | 2001, 2002, 2003 |
| France, Angers (FNAMS) | 2003 | 1 - 1 | alternate rows  | 0.5 - 0.5 | 1 N-treatment (130 kg N.ha-1) | (Corre-Hellou et al., 2006) |
| Denmark, Taastrup | 2003 | 1 - 1 | alternate rows  | 0.5 - 0.5 |  | (Hauggaard-Nielsen et al., 2009a; b; Launay et al., 2009) |
| France, Angers (Thorigné) | 2003, 2004 |
| Germany, Kassel | 2004 |
| Italy, San Marco Argentano | 2003, 2004 |
| United Kingdom, Reading | 2003 |
| Winter durum wheat – faba bean | France, Auzeville | 2010 | 1 - 1 | alternate rows; within-row | 0.33 - 0.5; 0.5 - 0.5; 0.67 - 0.5  | 3 N-treatments (60, 80, 140 kg N.ha-1) |  |
| France, Auzeville (PK) | 2011 | 1 - 1 | alternate rows | 0.5 - 0.5 | (3 P-treatments: P0, 11 and 33 kg P.ha-1) | (Tang et al., 2016) |
| France, Auzeville (PP) | 2011 | 1 - 1 | within-row | 0.5 - 0.5 | 1 N-treatment (140 kg N.ha-1) |  |
| France, Auzeville | 2012 | 3 - 4  | within-row | 0.5 - 0.5 |  | (Kammoun, 2014) |
| France, Auzeville | 2013 | 3 - 4  | within-row | 0.5 - 0.5 | 1 N-treatment for wheat in SC (140 kg N.ha-1) | (Kammoun, 2014) |
| Winter durum wheat - pea | France, Auzeville | 2006 | 1 - 1 | alternate rows | 0.5 - 0.5 | 2 N-treatments (100, 180 kg N.ha-1), except for pea in SC | (Bedoussac and Justes, 2010a; b) |
| France, Auzeville | 2007 | 4 - 1 | alternate rows | 0.5 - 0.5 | 3 N-treatments (60, 80, 140 kg N.ha-1), except for pea in SC | (Bedoussac and Justes, 2010a; b) |
| France, Auzeville | 2012 | 3 - 4 | within-row | 0.5 - 0.5 |  | (Kammoun, 2014) |
| France, Auzeville | 2013 | 3 - 5 | within-row | 0.5 - 0.5 | 1 N-treatment (140 kg N.ha-1), except for pea in SC | (Kammoun, 2014) |
| France, Auzeville | 2015 | 1 - 4 | within-row | 0.5 - 0.5 |  |  |
| Winter soft wheat - pea | France, Angers (Thorigné) | 2006 | 1 - 1 | within-row | 0.3 - 0.7; 0.5 - 0.5 |  |  |
| France, Angers (Thorigné) | 2007 | 1 - 1 | within-row | 0.5 - 0.5; 0.7 - 0.3  | 1 N-treatment (30 kg N.ha-1), except for pea in SC |  |
| France, Angers (La Jaillière) | 2007, 2008 | 1 - 1 | within-row | 0.5 - 0.5 | 4 N-treatments:* 45 kg N.ha-1 for all IC and wheat in SC
* 190 kg N.ha-1 for wheat in SC
* 45 (later in the cycle) and 30 kg N.ha-1 for all IC
 | (Naudin et al., 2010, 2014) |
| France, Angers (Thorigné) | 2008 | 1 - 1 | within-row | 0.5 - 0.5; 0.7 - 0.3  | 3 N-treatments:* 110 kg N.ha-1 for wheat in SC
* 35 and 72 kg N.ha-1 for all IC
 |  |
| France, Angers (Thorigné) | 2009 | 1 - 1 | within-row | 0.5 - 0.5; 0.7 - 0.3  | 1 N-treatment (40 g N.ha-1), except for pea SC |  |
| France, Grignon | 2010 | 1 - 1 | within-row | 0.33 - 0.66; 0.5 - 0.5; 0.7 - 0.5 | 5 N-treatments:* 200 kg N.ha-1 for wheat in SC
* 90 kg N.ha-1 for wheat in SC and all IC
* 140 kg N.ha-1 for IC 0.5-0.5 (end of winter or flowering)
* 45 kg N.ha-1 for IC 0.33-0.66
 | (Pelzer et al., 2016) |
| France, Grignon | 2017 | 1 - 2 | within-row | 0.5 - 0.5 |  |  |

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