Supplementary Material Table S1. Analysis of variance for the split-plot design

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| --- | --- | --- | --- | --- | --- | --- |
| Growing seasons | Factors | Source of variation | Degrees  of freedom | Sum  of squares | F value | P value |
| 2013–2014 | Soil respiration rate | A | 1 | 0.0 | 0.1 | 0.8 |
| B | 1 | 96.7 | 327.4 | 0.0 |
| A×B | 1 | 6.26 | 21.2 | 0.9 |
| CO2-C cumulative emissions | A | 1 | 11.9 | 10.0 | 0.1 |
| B | 1 | 92.0 | 76.4 | 0.0 |
| A×B | 1 | 6.6 | 5.5 | 1.0 |
| Yield carbon utilization efficiency | A | 1 | 0.0 | 5.2 | 0.1 |
| B | 1 | 0.1 | 106.7 | 0.0 |
| A×B | 1 | 0.0 | 1.6 | 0.2 |
| 2014–2015 | Soil respiration rate | A | 1 | 5.7 | 6.7 | 0.3 |
| B | 1 | 205.1 | 243.9 | 0.0 |
| A×B | 1 | 6.3 | 7.5 | 0.3 |
| CO2-C cumulative emissions | A | 1 | 5.1 | 3.0 | 0.1 |
| B | 1 | 159.6 | 93.1 | 0.0 |
| A×B | 1 | 0.3 | 0.2 | 0.7 |
| Yield carbon utilization efficiency | A | 1 | 0.0 | 0.1 | 0.8 |
| B | 1 | 0.0 | 36.2 | 0.0 |
| A×B | 1 | 0.0 | 0.2 | 0.7 |

A represent planting system, B represent straw mulching, and A×B represent the planting system coupled with straw mulching.