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| **Table S3 GHG emissions, carbon stock, carbon balance, and carbon economic efficiency of agricultural production systems in Minqin Oasis.** |
| 　 | ICP | ICLP | IFLP | EGLP | SED1 | P-Value |
| Carbon balance (tonne CO2-eq /farm) |
|  Crop & Rangeland (not including livestock) |
|  GHG emissions2 | 10.2b | 9.2b | - | 9,978.0a | 31.02 | <0.001 |
|  Carbon stock3 | 7.6b | 8.0b | - | 39,430.0a | 125.40 | <0.001 |
|  Carbon balance4 | -2.5b | -0.7b | - | 29,451.0a | 96.30 | <0.001 |
|  Livestock |
|  GHG emissions5 | - | 7.3c | 191.8a | 79.1b | 1.59 | <0.001 |
|  Carbon stock6 | - | 0.25c | 6.48a | 2.68b | 0.049 | <0.001 |
|  Carbon balance7 | - | -7.07a | -185.33c | -76.45b | 1.553 | <0.001 |
|  Crop & Rangeland (including livestock) |
|  GHG emissions | 10.2c | 16.0c | 192.0b | 10,058.0a | 27.13 | <0.001 |
|  Carbon stock | 7.6b | 9.0b | 6.0b | 39,432.0a | 109.51 | <0.001 |
|  Carbon balance | -2.5b | -8.0b | -185.0c | 29,375.0a | 84.00 | <0.001 |
| Carbon economic efficiency (1,000 CN¥/tonne CO2-eq /farm) |
| CN¥ (1000¥/tonne CO2-eq /farm) |
| Crop & Rangeland(not including livestock) | 5.12a | 5.24a | - | 3.26b | 0.041 | <0.001 |
|  Livestock | - | 2969.0a | 2771.0b | 3,015.0a | 25.94 | <0.001 |
| Crop & Rangeland (including livestock) | 5.12b | 10.19b | 2771.00a | 93.80b | 40.401 | <0.001 |
| US$8(160$/tonne CO2-eq /farm) |
| Crop & Rangeland(not including livestock) | 0.82a | 0.84a | - | 0.52b | 0.006 | <0.001 |
|  Livestock | - | 475.1a | 443.3b | 482.4a | 4.15 | <0.001 |
| Crop & Rangeland (including livestock) | 0.82b | 1.63b | 443.30a | 8.81b | 6.46 | <0.001 |
| Crop & Rangeland (including livestock) (tonne CO2-eq /ha) |
|  GHG emissions | 12.7a | 12.6a | - | 5.6b | 0.04 | <0.001 |
|  Carbon stock | 9.6c | 12.1b | - | 22.2a | 0.08 | <0.001 |
|  Carbon balance | -3.2c | -0.6b | - | 16.6a | 0.07 | <0.001 |
| 1SED: standard error of differences; 2GHG emissions from crop production inputs; 3carbon stock of the net accumulation of photosynthesis from crop products, such as the grain, stem, and root; 4carbon balances of crop production (carbon stock - GHG emissions); 5GHG emissions from livestock production; 6carbon stock from livestock products, such as the carcass, milk and wool; 7carbon balances of livestock production (carbon stock - GHG emissions); 8US$: An average of the US$ : CN¥ exchange rate for the years 2014 to 2015 of 1 US$ : 6.25 CN¥ has been used to show prices in both currencies (http://finance.yahoo.com/chart/USDCNY); similar letters: no significant difference; dissimilar letters (a, b, c) indicates a significant difference (*P*<0.05). |