Table S4 Multivariate analysis of variance by three way ANOVA of the soil chemical properties including soil organic matter (SOM; n=3) with two level 0-20 cm and 20-40 cm; soil physical properties including soil bulk density (SBD; n=3) and relative water content (RWC; n=3) with the 0-20 cm depth and soil biological properties including soil earthworm density (SED; n=3) and biomass (SEB; n=3) with the 30 cm (length) × 30 cm (width) × 20 cm (depth)

|  |  |  |
| --- | --- | --- |
| Sources | df | F-value |
| Physical Properties |  | Biological Properties |  | Chemical Properties |
| SBD | RWC |  | SEB | SED |  | SOM,0-20 cm | SOM,20-40 cm |
| Rotation | 1 | 9.97\*\* | 0.08n.s. |  | 0.70n.s. | 31.1\*\*\* |  | 21.0\*\*\* | 4.81\*\* |
| Herbicide | 1 | 0.01n.s. | 8.76\*\* |  | 32.67\*\*\* | 71.7\*\*\* |  | 81.3\*\*\* | 16.06\*\*\* |
| Tillage | 1 | 9.54\*\* | 3.76\* |  | 0.70n.s. | 1.90n.s. |  | 4.7\*\* | 8.67\*\* |
| Rotation\*Herbicide | 1 | 0.25n.s. | 5.57\* |  | 1.1n.s. | 3.14\* |  | 81.9\*\*\* | 3.41\* |
| Rotation\*Tillage | 1 | 0.20n.s. | 2.69n.s. |  | 0.77n.s. | 0.11n.s. |  | 58.6\*\*\* | 0.61n.s. |
| Herbicide\*Tillage | 1 | 0.004n.s. | 3.60\* |  | 0.50n.s. | 0.52n.s. |  | 21.5\*\*\* | 1.52n.s. |
| Rotation\*Herbicide\*Tillage | 1 | 8.05\*\* | 0.52n.s. |  | 2.58n.s. | 1.56n.s. |  | 11.9\*\* | 1.55n.s. |

The categorical factors are rotation, herbicide and tillage. Presented are the F-values with the level of significance; \**P*<0.05, \*\**P*<0.01, \*\*\**P*<0.001, n.s.-no significant.