**Table S1** Effect of different farming modes and soil depths on soil microbial marker PLFA during October

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **PLFA markers** | **Type of microorganism** | **PLFA Content (n mol %)** | | | | | |
| **0-20cm** | | | **20-40cm** | | |
| **COF** | **LOF** | **ORF** | **COF** | **LOF** | **ORF** |
| 14:00 | G+ | 0.7115 | 0.6538 | 1.1666 | 0.1753 | 0.1375 | 0.8000 |
| 15:00 | G+ | 0.5755 | 0.5450 | 0.7799 | --- | --- | 0.5674 |
| 16:00 | Bacteria | 10.2732 | 12.7855 | 14.8960 | 5.1869 | 6.2429 | 11.7395 |
| 17:00 | G+ | 0.9073 | 0.7071 | 0.8649 | --- | --- | 0.3352 |
| 18:00 | G- | 3.8438 | 3.0201 | 3.0782 | 1.1229 | 2.1228 | 2.5656 |
| 20:00 | Bacteria | 0.1470 | 0.3013 | 0.5656 | --- | --- | 0.1152 |
| 15:0 anteiso | G+ | 2.4952 | 3.3553 | 5.5798 | 1.1556 | 1.2026 | 4.2888 |
| 15:0 iso | G+ | 5.3069 | 6.8720 | 11.9076 | 2.2056 | 2.7045 | 8.8123 |
| 16:0 10-methyl | Actinomycetes | 5.7877 | 7.3122 | 8.3444 | 3.5891 | 4.6668 | 8.1893 |
| 16:0 iso | G+ | 1.9819 | 2.3124 | 3.5136 | 0.8807 | 1.3142 | 2.7768 |
| 16:1 2OH | G- | 1.0665 | 1.2742 | 1.5045 | 0.3552 | 1.0865 | 1.8845 |
| 16:1 w7c | G- | --- | 0.0675 | 0.2174 | --- | --- | --- |
| 17:0 10-methyl | Actinomycetes | --- | 0.2343 | 0.5088 | --- | --- | 0.2936 |
| 17:0 anteiso | G+ | 1.6458 | 1.9166 | 2.2883 | 0.7316 | 1.3226 | 2.0338 |
| 17:0 cyclo | G- | 2.2690 | 3.0638 | 3.6867 | 0.8872 | 1.3090 | 2.7375 |
| 17:0 iso | G+ | 2.1835 | 2.7999 | 3.6321 | 0.8813 | 1.6043 | 2.8882 |
| 17:1 iso w9c | G- | 5.8375 | 7.3751 | 8.4161 | 3.6200 | 4.7070 | 8.2598 |
| 18:0 10-methyl，TBSA | Actinomycetes | 1.7476 | 1.9181 | 1.6398 | --- | 1.1860 | 2.5008 |
| 18:1 w9c | Fungi | 0.3364 | 0.3648 | --- | --- | 0.1603 | 0.1887 |
| 18:3 w6c (6，9，12) | Fungi | 0.2098 | 0.1175 | 0.1103 | --- | --- | 0.0542 |
| 19:0 cyclo w8c | G- | 9.1874 | 10.6447 | 8.7017 | 4.5083 | 6.8641 | 6.9270 |
| 20:2 w6，9c | Protozoa | 3.8876 | 3.0751 | 2.0982 | --- | 2.8049 | 2.3052 |

Where, October and December- Months of soil sampling; *COF* Conventional farming; *LOF* Low input farming; *ORF* Organic farming; 0-20 & 20-40 (cm) - Soil depth from where soil samples were collected; *PLFA* Phospho-lipid fatty acid

**Table S2**. Effect of different farming modes and soil depth on soil microbial marker PLFA during December

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **PLFA markers** | **Type of microorganism** | **PLFA Content (n mol %)** | | | | | |
| **0-20cm** | | | **20-40cm** | | |
| **COF** | **LOF** | **ORF** | **COF** | **LOF** | **ORF** |
| 14:00 | G+ | 0.9693 | 3.0550 | 0.7922 | --- | 0.2904 | 0.2654 |
| 15:00 | G+ | 0.5961 | 0.8663 | 0.5805 | --- | 0.2316 | 0.1496 |
| 16:00 | Bacteria | 13.7231 | 4.8040 | 12.7268 | 5.5174 | 8.0836 | 8.1376 |
| 17:00 | G+ | 0.6739 | 1.0064 | 0.7447 | --- | 0.1774 | 0.2129 |
| 18:00 | G- | 2.3930 | 1.5697 | 3.1662 | 1.4015 | 1.9595 | 2.5138 |
| 20:00 | Bacteria | 0.1573 | 0.2286 | 0.3522 | --- | 0.1547 | 0.0993 |
| 14:0 iso | Bacteria | 0.6777 | 0.2860 | 0.5079 | --- | 0.2279 | 0.0936 |
| 15:0 anteiso | G+ | 3.7194 | 2.3679 | 3.7693 | 1.6953 | 2.4234 | 2.4154 |
| 15:0 iso | G+ | 7.9393 | 4.9023 | 7.8778 | 3.5837 | 5.1401 | 4.7267 |
| 16:0 10-methyl | Actinomycetes | 6.5250 | 9.5552 | 7.5001 | 4.1175 | 4.5667 | 6.3088 |
| 16:0 iso | G+ | 2.3181 | 1.4449 | 2.2530 | 1.1517 | 1.6610 | 1.6194 |
| 16:1 2OH | G- | 1.1419 | 0.2140 | 1.3464 | 0.6259 | 0.1786 | 1.7451 |
| 17:0 10-methyl | Actinomycetes | 0.3799 | 0.1330 | 0.4503 | --- | 0.1415 | 0.1232 |
| 17:0 anteiso | G+ | 1.5946 | 1.1295 | 1.9171 | 0.9319 | 1.3814 | 1.6275 |
| 17:0 cyclo | G- | 3.1674 | 1.9214 | 3.4131 | 0.9380 | 1.7837 | 1.6831 |
| 17:0 iso | G+ | 2.6048 | 1.6591 | 3.0054 | 1.1768 | 1.7146 | 2.0786 |
| 17:1 iso w9c | G- | 6.5811 | 8.6866 | 7.5646 | 4.1529 | 4.6060 | 6.3631 |
| 18:0 10-methyl， TBSA | Actinomycetes | 1.8913 | 1.8303 | 1.9579 | --- | 1.7214 | 1.9464 |
| 18:1 w9c | Fungi | 0.6197 | --- | --- | --- | --- | 0.2274 |
| 18:3 w6c (6，9，12) | Fungi | --- | --- | 0.3776 | --- | 0.3291 | 0.3267 |
| 19:0 cyclo w8c | G- | 8.2958 | 5.6277 | 11.6339 | 3.9917 | 5.0423 | 7.6010 |
| 20:2 w6，9c | Protozoa | 2.5785 | 2.1969 | 3.2094 | --- | 1.4733 | 3.1315 |

Where, October and December- Months of soil sampling; *COF* Conventional farming; *LOF* Low input farming; *ORF* Organic farming; 0-20 & 20-40 (cm) - Soil depth from where soil samples were collected; *PLFA* Phospho-lipid fatty acid

**Table S3** Number of microbial species at each level of classification under different farming modes and soil depths

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sampling**  **time** | **Depth** | **Farming**  **mode** | **Kingdom** | **Phylum** | **Class** | **Order** | **Family** | **Genus** | **Species** |
| **October** | **0-20cm** | **COF** | 2 | 28 | 62 | 76 | 136 | 175 | 15 |
| **LOF** | 2 | 29 | 67 | 78 | 143 | 186 | 20 |
| **ORF** | 2 | 28 | 58 | 75 | 138 | 174 | 18 |
| **20-40cm** | **COF** | 2 | 28 | 62 | 72 | 129 | 165 | 16 |
| **LOF** | 2 | 28 | 66 | 81 | 141 | 174 | 19 |
| **ORF** | 2 | 30 | 64 | 75 | 141 | 170 | 15 |
| **December** | **0-20cm** | **COF** | 2 | 27 | 63 | 77 | 137 | 175 | 18 |
| **LOF** | 2 | 29 | 63 | 77 | 134 | 172 | 16 |
| **ORF** | 2 | 27 | 58 | 72 | 135 | 165 | 19 |
| **20-40cm** | **COF** | 2 | 27 | 63 | 74 | 130 | 154 | 16 |
| **LOF** | 2 | 27 | 62 | 76 | 129 | 160 | 15 |
| **ORF** | 2 | 29 | 63 | 75 | 135 | 167 | 18 |

Where, October and December- Months of soil sampling; *COF* Conventional farming; *LOF* Low input farming; *ORF* Organic farming; 0-20 & 20-40 (cm) – Soil depth from where soil samples were collected

**Table S4** Statistics of soil microbial alpha diversity indices at different farming modes, soil depths and sampling time

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sampling**  **time** | **Depth** | **Farming**  **mode** | **ACE** | **Chao index** | **Simpson index** | **Shannon index** | **Coverage rate** |
| **October** | **0-20cm** | **COF** | 1160.996 | 1187.172 | 0.994 | 8.474 | 0.995 |
| **LOF** | 1221.830 | 1242.295 | 0.986 | 8.658 | 0.995 |
| **ORF** | 1135.688 | 1157.500 | 0.995 | 8.621 | 0.996 |
| **20-40cm** | **COF** | 1147.224 | 1164.264 | 0.994 | 7.993 | 0.995 |
| **LOF** | 1254.026 | 1280.429 | 0.995 | 8.590 | 0.995 |
| **ORF** | 1165.169 | 1162.167 | 0.992 | 8.228 | 0.995 |
| **December** | **0-20cm** | **COF** | 1179.944 | 1188.812 | 0.993 | 8.442 | 0.995 |
| **LOF** | 1145.791 | 1160.779 | 0.987 | 8.399 | 0.995 |
| **ORF** | 1136.945 | 1126.047 | 0.994 | 8.454 | 0.996 |
| **20-40cm** | **COF** | 1147.926 | 1200.396 | 0.989 | 7.960 | 0.994 |
| **LOF** | 1170.366 | 1180.615 | 0.994 | 7.957 | 0.994 |
| **ORF** | 1209.721 | 1220.049 | 0.99 | 8.144 | 0.994 |

Where, October and December- Months of soil sampling; *COF* Conventional farming; *LOF* Low input farming; *ORF* Organic farming; 0-20 & 20-40 (cm) - Soil depth from where soil samples were collected