# Supplementary data

Table S1. Pearson correlation matrices for all soil samples (n=39). SWC= soil water content, EC= electrical conductivity, SOM= soil organic matter, M3=Mehlich-3, P= phosphorus, Ca= calcium, Mg= magnesium, Fe=iron, Cu= copper, Mn= manganese, Zn= zinc, B= boron, Na= sodium, Al= aluminium, S= sulfur, FF= fungivore abundance, BF= bacterivore abundance, PF= herbivore abundance. Soil cations are Mehlich-3 extractable forms. P<0.10, \*P≤0.05, \*\*P≤0.01, \*\*\*P≤0.001.

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| **Table S1a. Correlations between soil properties** |
| **Soil property**  |  **silt** | **sand** | **SWC** | **pH** | **EC** | **SOM** | **citric P** | **water P** | **Mehlich-3 P** | **M3-Ca** | **M3-Mg** | **M3-K** | **M3-Fe** | **M3-Cu** | **M3-Mn** | **M3-Zn** | **M3-B** | **M3-Na** | **M3-Al** | **M3-S** |
| **clay** | 0.67\*\*\* | -0.88\*\*\* | 0.79\*\*\* | -0.03 | 0.75\*\*\* | 0.77\*\*\* | -0.46\*\* | 0.26 | 0.42\*\* | 0.57\*\* | 0.26 | -0.17 | 0.52\*\* | 0.62\*\*\* | 0.71\*\*\* | 0.81\*\*\* | 0.41\*\* | 0.76\*\*\* | -0.65\*\*\* | 0.43\*\* |
| **silt** |  | -0.94\*\*\* | 0.9\*\*\* | 0 | 0.7\*\*\* | 0.86\*\*\* | -0.76\*\*\* | 0.52\*\* | 0.74\*\*\* | 0.75\*\*\* | 0.38\*\* | -0.52\*\* | 0.57\*\* | 0.36\*\* | 0.64\*\*\* | 0.86\*\*\* | 0.22 | 0.57\*\* | -0.87\*\*\* | 0.48\*\* |
| **sand** |  |  | -0.93\*\*\* | 0.02 | -0.8\*\*\* | -0.91\*\*\* | 0.69\*\*\* | -0.45\*\* | -0.66\*\*\* | -0.74\*\*\* | -0.35. | 0.42\*\* | -0.6\*\*\* | -0.51\*\* | -0.74\*\*\* | -0.92\*\*\* | -0.32. | -0.7\*\*\* | 0.85\*\*\* | -0.51\*\* |
| **SWC** |  |  |  | -0.48\*\* | 0.49\*\* | 0.94\*\*\* | -0.2 | 0.71\*\*\* | -0.08 | -0.09 | 0.47\*\* | -0.33\*\* | 0.22 | 0.2 | 0.22 | 0.63\*\*\* | 0.36\*\* | 0.64\*\*\* | -0.87\*\*\* | -0.38\*\* |
| **pH** |  |  |  |  | 0.25 | -0.38\*\* | 0.27. | 0.11 | 0.35\*\* | 0.71\*\*\* | 0.44\*\* | 0.13 | -0.59\*\*\* | 0.42\*\* | 0.13 | 0.2 | 0.25 | -0.57\*\*\* | 0.15 | 0.55\*\*\* |
| **EC** |  |  |  |  |  | 0.46\*\* | -0.11 | 0.51\*\*\* | 0.4\*\* | 0.61\*\*\* | 0.61\*\*\* | -0.04 | -0.06 | 0.81\*\*\* | 0.69\*\*\* | 0.78\*\*\* | 0.65\*\*\* | 0.4\*\* | -0.68\*\*\* | 0.38\*\* |
| **SOM** |  |  |  |  |  |  | -0.05 | 0.78\*\*\* | -0.12 | -0.08 | 0.53\*\*\* | -0.24 | -0.05 | 0.21 | 0.16 | 0.66\*\*\* | 0.29. | 0.6\*\*\* | -0.83\*\*\* | -0.37\*\* |
| **citric P** |  |  |  |  |  |  |  | 0.17 | -0.53\*\*\* | -0.24 | 0.08 | 0.66\*\*\* | -0.63\*\*\* | 0.06 | -0.27. | -0.05 | 0.22 | -0.2 | 0.25 | -0.15 |
| **water P** |  |  |  |  |  |  |  |  | -0.05 | 0.17 | 0.81\*\*\* | -0.2 | -0.35\*\* | 0.3. | 0.13 | 0.79\*\*\* | 0.48\*\* | 0.17 | -0.81\*\*\* | -0.17 |
| **M3-P** |  |  |  |  |  |  |  |  |  | 0.78\*\*\* | 0.2 | -0.29. | 0.22 | 0.32\*\* | 0.31. | 0.21 | 0.19 | -0.03 | -0.18 | 0.67\*\*\* |
| **M3-Ca** |  |  |  |  |  |  |  |  |  |  | 0.57\*\*\* | -0.16 | -0.16 | 0.56\*\*\* | 0.46\*\* | 0.46\*\* | 0.45\*\* | -0.1 | -0.27 | 0.75\*\*\* |
| **M3-Mg** |  |  |  |  |  |  |  |  |  |  |  | -0.13 | -0.34\*\* | 0.51\*\*\* | 0.17 | 0.71\*\*\* | 0.62\*\*\* | 0.01 | -0.71\*\*\* | 0.2 |
| **M3-K** |  |  |  |  |  |  |  |  |  |  |  |  | -0.28. | 0.16 | -0.05 | -0.25 | 0.31. | 0.07 | 0.41\*\* | 0.21 |
| **M3-Fe** |  |  |  |  |  |  |  |  |  |  |  |  |  | -0.09 | 0.08 | -0.24 | 0 | 0.28. | -0.06 | -0.02 |
| **M3-Cu** |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.49\*\* | 0.52\*\*\* | 0.55\*\*\* | 0.19 | -0.39\*\* | 0.42\*\* |
| **M3-Mn** |  |  |  |  |  |  |  |  |  |  |  |  | . |  |  | 0.62\*\*\* | 0.44\*\* | 0.4\*\* | -0.29. | 0.45\*\* |
| **M3-Zn** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.6\*\*\* | 0.3. | -0.76\*\*\* | 0.18 |
| **M3-B** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.18 | -0.44\*\* | 0.43\*\* |
| **M3-Na** |  |  |  |  |  |  |  |  |  |  |  | . |  |  |  |  |  |  | -0.49\*\* | -0.22 |
| **M3-Al** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.14 |

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| **Table S1b. Correlations between functional parameters and soil properties** |
| **Soil properties** | **basal rate change** | **mean basal** | **burst rate change** | **Mean burst** | **total nematodes** | **bacterivores** | **fungivores** | **herbivores** | **omnivores** | **predators** | **FF/BF** | **FF/(FF+BF)** | **(FF+BF)/PF** |
| **clay** | -0.82\*\*\* | 0.44\*\* | -0.8\*\*\* | 0.7\*\*\* | 0.32. | 0.21 | -0.12 | 0.59\*\*\* | 0.25 | -0.09 | -0.18 | -0.17 | -0.27 |
| **silt** | -0.66\*\*\* | 0.55\*\* | -0.64\*\*\* | 0.79\*\*\* | 0.36\*\* | 0.25 | -0.16 | 0.63\*\*\* | 0.29 | -0.16 | -0.29 | -0.3 | -0.31. |
| **sand** | 0.8\*\*\* | -0.55\*\* | 0.77\*\*\* | -0.83\*\*\* | -0.38\*\* | -0.26 | 0.16 | -0.67\*\*\* | -0.3 | 0.14 | 0.27 | 0.28 | 0.32. |
| **SWC** | -0.91\*\*\* | 0.93\*\*\* | -0.76\*\*\* | 0.89\*\*\* | -0.37\*\* | -0.4\*\* | -0.29. | 0.05 | -0.08 | -0.13 | -0.04 | -0.04 | -0.38\*\* |
| **pH** | 0.53\*\*\* | -0.43\*\* | 0.22 | -0.27. | 0.27. | 0.3. | 0.15 | -0.02 | -0.04 | 0.05 | -0.22 | -0.24 | 0.1 |
| **EC** | -0.47\*\* | 0.44\*\* | -0.47\*\* | 0.55\*\*\* | 0.04 | 0.01 | -0.15 | 0.2 | 0.1 | -0.15 | -0.29. | -0.31. | -0.36\*\* |
| **SOM** | -0.92\*\*\* | 0.86\*\*\* | -0.87\*\*\* | 0.89\*\*\* | -0.39\*\* | -0.4\*\* | -0.28. | -0.03 | -0.08 | -0.13 | -0.09 | -0.08 | -0.3. |
| **citric P** | 0.12 | -0.08 | -0.01 | 0.03 | 0.01 | 0.08 | 0.4\*\* | -0.48\*\* | -0.07 | 0.26 | 0.25 | 0.22 | 0.28. |
| **water P** | -0.57\*\*\* | 0.68\*\*\* | -0.62\*\*\* | 0.78\*\*\* | -0.37\*\* | -0.35\*\* | -0.22 | -0.17 | -0.16 | -0.09 | -0.2 | -0.22 | -0.18 |
| **M3-P** | 0.14 | -0.13 | 0.03 | -0.13 | 0.28. | 0.23 | -0.07 | 0.38\*\* | 0.08 | -0.13 | -0.23 | -0.25 | -0.2 |
| **M3-Ca** | 0.16 | -0.15 | 0.01 | -0.07 | 0.31. | 0.26 | -0.01 | 0.37\*\* | 0.07 | 0.04 | -0.26 | -0.28. | -0.23 |
| **M3-Mg** | -0.32\*\* | 0.47\*\* | -0.41\*\* | 0.47\*\* | -0.23 | -0.21 | -0.16 | -0.09 | -0.2 | -0.03 | -0.21 | -0.22 | -0.23 |
| **M3-K** | 0.19 | -0.21 | 0.08 | -0.18 | 0.07 | 0.1 | 0.49\*\* | -0.33\*\* | 0.06 | -0.06 | 0.41\*\* | 0.38\*\* | 0.21 |
| **M3-Fe** | -0.15 | 0.2 | 0.13 | -0.04 | -0.09 | -0.15 | -0.17 | 0.31. | -0.06 | -0.13 | 0.11 | 0.14 | -0.21 |
| **M3-Cu** | -0.26 | 0.2 | -0.36\*\* | 0.33\*\* | 0.05 | 0.04 | -0.12 | 0.13 | -0.04 | -0.1 | -0.28. | -0.28. | -0.30. |
| **M3-Mn** | -0.28. | 0.11 | -0.14 | 0.26 | 0.22 | 0.12 | -0.1 | 0.53\*\*\* | 0.38\*\* | -0.21 | -0.23 | -0.24 | -0.24 |
| **M3-Zn** | -0.54\*\*\* | 0.52\*\*\* | -0.52\*\*\* | 0.67\*\*\* | -0.05 | -0.09 | -0.21 | 0.22 | 0.14 | -0.15 | -0.36\*\* | -0.38\*\* | -0.27. |
| **M3-B** | -0.25 | 0.4\*\* | -0.2 | 0.35\*\* | -0.01 | -0.05 | 0.17 | 0.06 | -0.01 | -0.07 | 0.07 | 0.03 | -0.2 |
| **M3-Na** | -0.75\*\*\* | 0.5\*\* | -0.53\*\*\* | 0.5\*\* | -0.01 | -0.08 | 0 | 0.24 | 0.25 | -0.14 | 0.23 | 0.24 | -0.24 |
| **M3-Al** | 0.75\*\*\* | -0.76\*\*\* | 0.63\*\*\* | -0.78\*\*\* | 0.28. | 0.31. | 0.32\*\* | -0.13 | 0.09 | 0.13 | 0.19 | 0.19 | 0.4\*\* |
| **M3-S** | 0.38\*\* | -0.35\*\* | 0.24 | -0.32\*\* | 0.28. | 0.24 | 0.06 | 0.28. | 0.14 | -0.01 | -0.23 | -0.26 | -0.11 |
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| **Table S1c. Correlations between functional properties** |
| **Functional parameters** | **mean basal** | **burst rate change** | **mean burst** | **total nematodes** | **bacterivores** | **fungivores** | **herbivores** | **omnivores** | **predators** | **FF/BF** | **FF/(FF+BF)** | **(FF+BF)/PF** |
| **basal rate change** | -0.78\*\*\* | 0.79\*\*\* | -0.81\*\*\* | 0.32\*\* | 0.36\*\* | 0.26 | -0.09 | -0.01 | 0.13 | 0 | -0.01 | 0.34\*\* |
| **mean basal** |  | -0.71\*\*\* | 0.87\*\*\* | -0.4\*\* | -0.39\*\* | -0.27. | -0.14 | -0.2 | -0.12 | -0.09 | -0.09 | -0.29. |
| **burst rate change** |  |  | -0.87\*\*\* | 0.31. | 0.31. | 0.24 | 0.04 | 0.09 | 0.11 | 0.12 | 0.12 | 0.27. |
| **mean burst** |  |  |  | -0.34\*\* | -0.35\*\* | -0.25 | -0.04 | -0.09 | -0.1 | -0.15 | -0.15 | -0.28. |
| **total nematodes** |  |  |  |  | 0.98\*\*\* | 0.65\*\*\* | 0.32\*\* | 0.55\*\*\* | 0.08 | 0.04 | 0.02 | 0.4\*\* |
| **bacterivores** |  |  |  |  |  | 0.64\*\*\* | 0.12 | 0.55\*\*\* | 0.09 | -0.02 | -0.03 | 0.47\*\* |
| **fungivores** |  |  |  |  |  |  | -0.13 | 0.51\*\*\* | -0.05 | 0.66\*\*\* | 0.63\*\*\* | 0.48\*\* |
| **herbivores** |  |  |  |  |  |  |  | 0.01 | -0.04 | -0.13 | -0.12 | -0.29. |
| **omnivores** |  | . |  |  |  |  |  |  | -0.1 | 0.2 | 0.18 | 0.25 |
| **predators** |  |  |  | . | . |  |  |  |  | -0.04 | -0.04 | -0.07 |
| **FF/BF** |  |  |  |  |  |  |  |  |  |  | 0.99\*\*\* | 0.08 |
| **FF/(FF+BF)** |  |  |  |  |  |  |  |  |  |  |  | 0.07 |

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Table S2. Pearson correlation matrices for natural soil (n=9). SWC= soil water content, EC= electrical conductivity, COM= soil organic matter, M3=Mehlich-3, P= phosphorus, Ca= calcium, Mg=magnesium, K= potassium, Fe= iron, Cu= copper, Mn= manganese, Zn= zinc, B= boron, Na= sodium, Al= aluminium, S= sulfur, FF= fungivore abundance, BF= bacterivore abundance, PF= herbivore abundance. Soil cations are Mehlich-3 extractable forms. **.** P<0.10, \*P≤0.05, \*\* P≤0.01,\*\*\*P≤0.001.

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| **Table S2a. Correlations between soil properties** |
| **Soil properties** | **pH** | **EC** | **SOM** | **citric P** | **water P** | **M3-P** | **M3-Ca** | **M3-Mg** | **M3-K** | **M3-Fe** | **M3-Cu** | **M3-Mn** | **M3-Zn** | **M3-B** | **M3-Na** | **M3-Al** | **M3-S** |
| **SWC** | 0.88\*\* | 0.93\*\*\* | 0.87\*\* | 0.77\*\* | 0.87\*\* | 0.26 | 0.82\*\* | 0.82\*\* | 0.19 | -0.82\*\* | 0.92\*\*\* | 0.85\*\* | 0.88\*\* | 0.65. | -0.29 | -0.76\*\* | 0.63. |
| **pH** |  | 0.93\*\*\* | 0.69\*\* | 0.82\*\* | 0.96\*\*\* | -0.02 | 0.94\*\*\* | 0.93\*\*\* | -0.2 | -0.78\*\* | 0.88\*\* | 0.89\*\* | 0.99\*\*\* | 0.86\*\* | -0.57 | -0.87\*\* | 0.56 |
| **EC** |  |  | 0.72\*\* | 0.86\*\* | 0.92\*\*\* | 0.09 | 0.82\*\* | 0.81\*\* | -0.14 | -0.77\*\* | 0.91\*\*\* | 0.93\*\*\* | 0.93\*\*\* | 0.75\*\* | -0.45 | -0.86\*\* | 0.51 |
| **SOM** |  |  |  | 0.71\*\* | 0.75\*\* | 0.58 | 0.71\*\* | 0.71\*\* | 0.42 | -0.93\*\*\* | 0.74\*\* | 0.53 | 0.72\*\* | 0.3 | 0.06 | -0.67\*\* | 0.37 |
| **citric P** |  |  |  |  | 0.78\*\* | 0.38 | 0.68\*\* | 0.64. | -0.07 | -0.78\*\* | 0.91\*\*\* | 0.65. | 0.84\*\* | 0.55 | -0.31 | -0.72\*\* | 0.22 |
| **water P** |  |  |  |  |  | -0.03 | 0.91\*\*\* | 0.92\*\*\* | -0.13 | -0.87\*\* | 0.79\*\* | 0.86\*\* | 0.95\*\*\* | 0.72\*\* | -0.39 | -0.96\*\*\* | 0.44 |
| **M3-P** |  |  |  |  |  |  | -0.05 | -0.08 | 0.61. | -0.37 | 0.31 | -0.22 | 0.03 | -0.35 | 0.35 | 0.12 | -0.17 |
| **M3-Ca** |  |  |  |  |  |  |  | 1\*\*\* | -0.15 | -0.79\*\* | 0.75\*\* | 0.82\*\* | 0.95\*\*\* | 0.82\*\* | -0.44 | -0.86\*\* | 0.68\*\* |
| **M3-Mg** |  |  |  |  |  |  |  |  | -0.15 | -0.8\*\* | 0.71\*\* | 0.83\*\* | 0.94\*\*\* | 0.81\*\* | -0.42 | -0.88\*\* | 0.67\*\* |
| **M3-K** |  |  |  |  |  |  |  |  |  | -0.22 | 0.08 | -0.26 | -0.2 | -0.48 | 0.63. | 0.24 | 0.01 |
| **M3-** |  |  |  |  |  |  |  |  |  |  | -0.72\*\* | -0.58. | -0.81\*\* | -0.37 | -0.02 | 0.84\*\* | -0.27 |
| **M3-Cu** |  |  |  |  |  |  |  |  |  |  |  | 0.8\*\* | 0.88\*\* | 0.69\*\* | -0.43 | -0.66. | 0.53 |
| **M3-Mn** |  |  |  |  |  |  |  |  |  |  |  |  | 0.88\*\* | 0.88\*\* | -0.55 | -0.82\*\* | 0.71\*\* |
| **M3-Zn** |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.84\*\* | -0.52 | -0.89\*\* | 0.57 |
| **M3-B** |  |  |  |  |  |  |  |  |  |  |  |  |  |  | -0.8\*\* | -0.65. | 0.73\*\* |
| **M3-Na** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.25 | -0.36 |
| **M3-Al** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | -0.38 |

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| **Table S2b. Correlations between functional parameters and soil properties** |
| **Soil properties** | **basal rate change** | **mean basal** | **burst rate change** | **mean burst** | **total nematodes** | **bacterivores** | **fungivores** | **herbivores** | **omnivores** | **predators** | **FF/BF** | **FF/(FF+BF)** | **(FF+BF)/PF** |
| **SWC** | -0.56 | 0.81\*\* | -0.7\*\* | 0.86\*\* | -0.95\*\*\* | -0.88\*\* | -0.96\*\*\* | -0.73\*\* | -0.69\*\* | -0.51 | -0.87\*\* | -0.87\*\* | -0.33 |
| **pH** | -0.29 | 0.64. | -0.41 | 0.71\*\* | -0.87\*\* | -0.78\*\* | -0.8\*\* | -0.75\*\* | -0.53 | -0.45 | -0.85\*\* | -0.86\*\* | -0.11 |
| **EC** | -0.41 | 0.75\*\* | -0.51 | 0.8\*\* | -0.85\*\* | -0.78\*\* | -0.88\*\* | -0.64. | -0.59. | -0.59. | -0.88\*\* | -0.9\*\* | -0.26 |
| **SOM** | -0.78\*\* | 0.51 | -0.83\*\* | 0.72\*\* | -0.9\*\*\* | -0.93\*\*\* | -0.88\*\* | -0.44 | -0.36 | -0.49 | -0.61. | -0.61. | -0.61. |
| **citric P** | -0.5 | 0.41 | -0.57 | 0.72\*\* | -0.77\*\* | -0.75\*\* | -0.72\*\* | -0.49 | -0.32 | -0.48 | -0.69\*\* | -0.71\*\* | -0.23 |
| **water P** | -0.37 | 0.59. | -0.45 | 0.73\*\* | -0.85\*\* | -0.8\*\* | -0.79\*\* | -0.64. | -0.39 | -0.42 | -0.78\*\* | -0.8\*\* | -0.26 |
| **M3-P** | -0.69\*\* | 0.02 | -0.74\*\* | 0.29 | -0.32 | -0.43 | -0.37 | 0.11 | -0.02 | -0.35 | -0.05 | -0.05 | -0.49 |
| **M3-Ca** | -0.29 | 0.58 | -0.31 | 0.53 | -0.84\*\* | -0.78\*\* | -0.78\*\* | -0.65. | -0.46 | -0.45 | -0.77\*\* | -0.78\*\* | -0.26 |
| **M3-Mg** | -0.29 | 0.58 | -0.31 | 0.52 | -0.83\*\* | -0.77\*\* | -0.78\*\* | -0.64. | -0.45 | -0.45 | -0.76\*\* | -0.77\*\* | -0.28 |
| **M3-K** | -0.42 | 0.12 | -0.71\*\* | 0.35 | -0.18 | -0.17 | -0.19 | -0.14 | -0.17 | 0.24 | 0.01 | 0.04 | -0.21 |
| **M3-Fe** | 0.63. | -0.42 | 0.69\*\* | -0.7\*\* | 0.83\*\* | 0.87\*\* | 0.8\*\* | 0.41 | 0.2 | 0.44 | 0.63. | 0.64. | 0.56 |
| **M3-Cu** | -0.45 | 0.7\*\* | -0.65. | 0.85\*\* | -0.87\*\* | -0.77\*\* | -0.86\*\* | -0.75\*\* | -0.67\*\* | -0.46 | -0.86\*\* | -0.87\*\* | -0.11 |
| **M3-Mn** | -0.2 | 0.8\*\* | -0.26 | 0.68\*\* | -0.76\*\* | -0.64. | -0.78\*\* | -0.71\*\* | -0.69\*\* | -0.45 | -0.86\*\* | -0.87\*\* | -0.1 |
| **M3-Zn** | -0.34 | 0.62. | -0.4 | 0.67\*\* | -0.87\*\* | -0.8\*\* | -0.82\*\* | -0.69\*\* | -0.5 | -0.51 | -0.84\*\* | -0.85\*\* | -0.2 |
| **M3-B** | 0.06 | 0.62. | 0.01 | 0.4 | -0.63. | -0.48 | -0.58. | -0.73\*\* | -0.63. | -0.37 | -0.75\*\* | -0.76\*\* | 0.17 |
| **M3-Na** | -0.32 | -0.42 | -0.17 | -0.19 | 0.3 | 0.15 | 0.25 | 0.55 | 0.47 | 0.32 | 0.5 | 0.51 | -0.47 |
| **M3-Al** | 0.36 | -0.47 | 0.29 | -0.59. | 0.73\*\* | 0.73\*\* | 0.7\*\* | 0.44 | 0.22 | 0.43 | 0.67\*\* | 0.69\*\* | 0.38 |
| **M3-S** | -0.05 | 0.72\*\* | -0.11 | 0.29 | -0.54 | -0.4 | -0.64. | -0.61. | -0.81\*\* | -0.31 | -0.67\*\* | -0.66. | -0.09 |

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| **Table S2c. Correlations between functional parameters** |
| **Functional parameters** | **mean basal** | **burst rate change** | **mean burst** | **total nematodes** | **bacterivores** | **fungivores** | **herbivores** | **omnivores** | **predators** | **FF/BF** | **FF/(FF+BF)** | **(FF+BF)/PF** |
| **basal rate change** | -0.13 | 0.68\*\* | -0.43 | 0.67. | 0.81\*\* | 0.58. | 0.06 | 0.04 | 0.3 | 0.11 | 0.12 | 0.65. |
| **mean basal** |  | -0.49 | 0.73\*\* | -0.63. | -0.47 | -0.82\*\* | -0.68\*\* | -0.92\*\*\* | -0.53 | -0.9\*\* | -0.89\*\* | -0.13 |
| **burst rate change** |  |  | -0.82\*\* | 0.69\*\* | 0.67\*\* | 0.7\*\* | 0.43 | 0.4 | 0.29 | 0.5 | 0.49 | 0.37 |
| **mean burst** |  |  |  | -0.77\*\* | -0.66. | -0.76\*\* | -0.73\*\* | -0.61. | -0.26 | -0.77\*\* | -0.77\*\* | -0.09 |
| **total nematodes** |  |  |  |  | 0.96\*\*\* | 0.9\*\*\* | 0.71\*\* | 0.55 | 0.42 | 0.72\*\* | 0.72\*\* | 0.31 |
| **bacterivores** |  |  |  |  |  | 0.86\*\* | 0.49 | 0.34 | 0.47 | 0.56 | 0.57 | 0.5 |
| **fungivores** |  |  |  |  |  |  | 0.57 | 0.68\*\* | 0.69\*\* | 0.85\*\* | 0.85\*\* | 0.5 |
| **herbivores** |  |  |  |  |  |  |  | 0.76\*\* | -0.02 | 0.73\*\* | 0.72\*\* | -0.38 |
| **omnivores** |  |  |  |  |  |  |  |  | 0.34 | 0.79\*\* | 0.78\*\* | -0.12 |
| **predators** |  |  |  |  |  |  |  |  |  | 0.57 | 0.58. | 0.62. |
| **FF/BF** |  |  |  |  |  |  |  |  |  |  | 1\*\*\* | 0.12 |
| **FF/(FF+BF)** |  |  |  |  |  |  |  |  |  |  |  | 0.13 |

Table S3. Pearson correlation matrices for all managed soil (n=30). SWC= soil water content, EC= electrical conductivity, SOM= soil organic matter, P= phosphorus, Ca= calcium, Mg= magnesium, K= potassium, Fe= iron, Cu= copper, Mn= manganese, Zn= zinc, B= boron, Na= sodium, Al= aluminium, S= sulfur, FF= fungivore abundance, BF= bacterivore abundance, PF= herbivore abundance. Soil cations are Mehlich-3 extractable forms. **.** P<0.10, \*P≤0.05, \*\*P≤0.01, \*\*\*P≤0.001.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **Table S3a. Correlations between soil properties** |
| **Soil properties** | **silt** | **sand** | **SWC** | **pH** | **EC** | **SOM** | **citric P** | **water P** | **Mehlich P** | **Ca** | **Mg** | **K** | **Fe** | **Cu** | **Mn** | **Zn** | **B** | **Na** | **Al** | **S** |
| **clay** | 0.67\*\*\* | -0.88\*\*\* | 0.79\*\*\* | -0.03 | 0.75\*\*\* | 0.77\*\*\* | -0.46\*\* | 0.26 | 0.42\*\* | 0.57\*\* | 0.26 | -0.17 | 0.52\*\* | 0.62\*\*\* | 0.71\*\*\* | 0.81\*\*\* | 0.41\*\* | 0.76\*\*\* | -0.65\*\*\* | 0.43\*\* |
| **silt** |  | -0.94\*\*\* | 0.9\*\*\* | 0 | 0.7\*\*\* | 0.86\*\*\* | -0.76\*\*\* | 0.52\*\* | 0.74\*\*\* | 0.75\*\*\* | 0.38\*\* | -0.52\*\* | 0.57\*\* | 0.36\*\* | 0.64\*\*\* | 0.86\*\*\* | 0.22 | 0.57\*\* | -0.87\*\*\* | 0.48\*\* |
| **sand** |  |  | -0.93\*\*\* | 0.02 | -0.8\*\*\* | -0.91\*\*\* | 0.69\*\*\* | -0.45\*\* | -0.66\*\*\* | -0.74\*\*\* | -0.35. | 0.42\*\* | -0.6\*\*\* | -0.51\*\* | -0.74\*\*\* | -0.92\*\*\* | -0.32. | -0.7\*\*\* | 0.85\*\*\* | -0.51\*\* |
| **SWC** |  |  |  | -0.01 | 0.76\*\*\* | 0.92\*\*\* | -0.72\*\*\* | 0.4\*\* | 0.67\*\*\* | 0.77\*\*\* | 0.4\*\* | -0.39\*\* | 0.68\*\*\* | 0.44\*\* | 0.78\*\*\* | 0.87\*\*\* | 0.41\*\* | 0.71\*\*\* | -0.84\*\*\* | 0.56\*\* |
| **pH** |  |  |  |  | 0.17 | -0.14 | 0.08 | 0.35. | 0.26 | 0.48\*\* | 0.75\*\*\* | -0.04 | -0.1 | 0.39\*\* | -0.32. | -0.24 | 0.11 | -0.13 | -0.29 | -0.07 |
| **EC** |  |  |  |  |  | 0.75\*\*\* | -0.39\*\* | 0.36\*\* | 0.56\*\* | 0.73\*\*\* | 0.55\*\* | 0.01 | 0.47\*\* | 0.8\*\*\* | 0.71\*\*\* | 0.75\*\*\* | 0.6\*\*\* | 0.72\*\*\* | -0.78\*\*\* | 0.66\*\*\* |
| **SOM** |  |  |  |  |  |  | -0.66\*\*\* | 0.4\*\* | 0.66\*\*\* | 0.67\*\*\* | 0.23 | -0.33. | 0.56\*\* | 0.41\*\* | 0.79\*\*\* | 0.93\*\*\* | 0.36. | 0.72\*\*\* | -0.78\*\*\* | 0.55\*\* |
| **citric P** |  |  |  | . |  |  |  | -0.48\*\* | -0.66\*\*\* | -0.56\*\* | -0.32. | 0.75\*\*\* | -0.72\*\*\* | -0.14 | -0.42\*\* | -0.58\*\*\* | 0.11 | -0.18 | 0.71\*\*\* | -0.36. |
| **water P** |  |  |  |  |  |  |  |  | 0.89\*\*\* | 0.7\*\*\* | 0.61\*\*\* | -0.33. | 0.5\*\* | 0.27 | 0.03 | 0.36\*\* | 0.21 | 0.02 | -0.63\*\*\* | 0.56\*\* |
| **Mehlich-3 P** |  |  |  |  |  |  |  |  |  | 0.86\*\*\* | 0.63\*\*\* | -0.42\*\* | 0.67\*\*\* | 0.35. | 0.3 | 0.57\*\*\* | 0.35. | 0.24 | -0.8\*\*\* | 0.69\*\*\* |
| **Ca** |  |  |  |  |  |  |  |  |  |  | 0.82\*\*\* | -0.34. | 0.59\*\*\* | 0.55\*\* | 0.4\*\* | 0.6\*\*\* | 0.5\*\* | 0.42\*\* | -0.89\*\*\* | 0.67\*\*\* |
| **Mg** |  |  |  |  |  |  |  |  |  |  |  | -0.12 | 0.43\*\* | 0.58\*\*\* | 0.01 | 0.13 | 0.41\*\* | 0.11 | -0.69\*\*\* | 0.52\*\* |
| **K** |  |  |  |  |  |  |  |  |  |  |  |  | -0.35. | 0.17 | -0.08 | -0.29 | 0.53\*\* | 0.22 | 0.44\*\* | 0.09 |
| **Fe** |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.39\*\* | 0.49\*\* | 0.52\*\* | 0.34. | 0.3 | -0.62\*\*\* | 0.66\*\*\* |
| **Cu** |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.45\*\* | 0.46\*\* | 0.54\*\* | 0.49\*\* | -0.57\*\* | 0.5\*\* |
| **Mn** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.85\*\*\* | 0.41\*\* | 0.81\*\*\* | -0.5\*\* | 0.45\*\* |
| **Zn** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.36\*\* | 0.75\*\*\* | -0.73\*\*\* | 0.56\*\* |
| **B** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.58\*\*\* | -0.34. | 0.72\*\*\* |
| **Na** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | -0.45\*\* | 0.4\*\* |
| **Al** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | -0.6\*\*\* |

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| **Table S3b. Correlations between functional parameters and soil properties** |
| **Soil properties** | **basal rate change** | **mean basal** | **burst rate change** | **mean burst** | **total nematodes** | **bacterivores** | **fungivores** | **herbivores** | **omnivores** | **predators** | **FF/BF** | **FF/(FF+BF)** | **(FF+BF)/PF** |
| **clay** | -0.82\*\*\* | 0.44\*\* | -0.8\*\*\* | 0.7\*\*\* | 0.32. | 0.21 | -0.12 | 0.59\*\*\* | 0.25 | -0.09 | -0.18 | -0.17 | -0.27 |
| **Silt** | -0.66\*\*\* | 0.55\*\* | -0.64\*\*\* | 0.79\*\*\* | 0.36\*\* | 0.25 | -0.16 | 0.63\*\*\* | 0.29 | -0.16 | -0.29 | -0.3 | -0.31. |
| **Sand** | 0.8\*\*\* | -0.55\*\* | 0.77\*\*\* | -0.83\*\*\* | -0.38\*\* | -0.26 | 0.16 | -0.67\*\*\* | -0.3 | 0.14 | 0.27 | 0.28 | 0.32. |
| **SWC** | -0.81\*\*\* | 0.64\*\*\* | -0.78\*\*\* | 0.85\*\*\* | 0.3 | 0.17 | -0.15 | 0.68\*\*\* | 0.3 | -0.22 | -0.18 | -0.18 | -0.44\*\* |
| **pH** | 0.19 | 0.14 | -0.16 | -0.13 | 0.02 | 0.06 | 0.12 | -0.17 | -0.31. | 0.17 | 0.22 | 0.24 | -0.18 |
| **EC** | -0.79\*\*\* | 0.68\*\*\* | -0.77\*\*\* | 0.83\*\*\* | 0.22 | 0.16 | -0.08 | 0.35. | 0.21 | -0.12 | -0.15 | -0.16 | -0.39\*\* |
| **SOM** | -0.8\*\*\* | 0.64\*\*\* | -0.76\*\*\* | 0.83\*\*\* | 0.32. | 0.22 | -0.15 | 0.59\*\*\* | 0.35. | -0.23 | -0.26 | -0.28 | -0.36. |
| **citric P** | 0.43\*\* | -0.39\*\* | 0.5\*\* | -0.47\*\* | 0.04 | 0.12 | 0.48\*\* | -0.52\*\* | -0.07 | 0.32. | 0.46\*\* | 0.45\*\* | 0.31. |
| **water P** | -0.09 | 0.32. | -0.4\*\* | 0.18 | -0.01 | -0.04 | -0.11 | 0.14 | -0.09 | -0.11 | -0.07 | -0.07 | -0.22 |
| **Mehlich-3 P** | -0.36. | 0.63\*\*\* | -0.58\*\*\* | 0.47\*\* | 0.13 | 0.08 | -0.16 | 0.35. | 0.01 | -0.15 | -0.22 | -0.23 | -0.32. |
| **Ca** | -0.51\*\* | 0.64\*\*\* | -0.73\*\*\* | 0.58\*\*\* | 0.21 | 0.12 | -0.1 | 0.45\*\* | 0.02 | 0.06 | -0.09 | -0.09 | -0.46\*\* |
| **Mg** | -0.15 | 0.46\*\* | -0.52\*\* | 0.22 | -0.03 | -0.05 | -0.06 | 0.1 | -0.21 | 0.07 | 0.05 | 0.07 | -0.35. |
| **K** | 0.08 | -0.07 | 0.11 | -0.18 | -0.05 | -0.01 | 0.47\*\* | -0.39\*\* | 0.03 | -0.08 | 0.51\*\* | 0.48\*\* | 0.17 |
| **Fe** | -0.5\*\* | 0.51\*\* | -0.59\*\*\* | 0.5\*\* | -0.09 | -0.21 | -0.35. | 0.57\*\*\* | -0.06 | -0.32. | -0.25 | -0.25 | -0.29 |
| **Cu** | -0.61\*\*\* | 0.46\*\* | -0.7\*\*\* | 0.55\*\* | 0.1 | 0.07 | -0.1 | 0.2 | 0 | -0.09 | -0.14 | -0.13 | -0.36. |
| **Mn** | -0.92\*\*\* | 0.48\*\* | -0.58\*\*\* | 0.89\*\*\* | 0.22 | 0.1 | -0.11 | 0.59\*\*\* | 0.42\*\* | -0.21 | -0.13 | -0.13 | -0.3 |
| **Zn** | -0.86\*\*\* | 0.48\*\* | -0.71\*\*\* | 0.88\*\*\* | 0.36. | 0.24 | -0.13 | 0.64\*\*\* | 0.43\*\* | -0.15 | -0.25 | -0.26 | -0.34. |
| **B** | -0.48\*\* | 0.5\*\* | -0.54\*\* | 0.43\*\* | 0.17 | 0.08 | 0.33. | 0.22 | 0.09 | -0.04 | 0.35. | 0.32. | -0.23 |
| **Na** | -0.82\*\*\* | 0.49\*\* | -0.66\*\*\* | 0.73\*\*\* | 0.38\*\* | 0.28 | 0.16 | 0.43\*\* | 0.46\*\* | -0.2 | 0.11 | 0.1 | -0.14 |
| **Al** | 0.61\*\*\* | -0.57\*\* | 0.77\*\*\* | -0.71\*\*\* | -0.18 | -0.09 | 0.23 | -0.52\*\* | -0.09 | 0.14 | 0.28 | 0.29 | 0.42\*\* |
| **S** | -0.52\*\* | 0.57\*\*\* | -0.63\*\*\* | 0.53\*\* | -0.02 | -0.09 | -0.11 | 0.31 | 0.09 | -0.03 | -0.09 | -0.11 | -0.4\*\* |

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| **Table S3c. Correlations between functional parameters** |
| **Functional parameters** | **mean basal** | **burst rate change** | **mean burst** | **total nematodes** | **bacterivores** | **fungivores** | **herbivores** | **omnivores** | **predators** | **FF/BF** | **FF/(FF+BF)** | **(FF+BF)/PF** |
| **basal rate change** | -0.51\*\* | 0.78\*\*\* | -0.89\*\*\* | -0.3 | -0.19 | 0.12 | -0.58\*\*\* | -0.4\*\* | 0.2 | 0.22 | 0.22 | 0.32. |
| **mean basal** |  | -0.54\*\* | 0.58\*\*\* | 0.19 | 0.17 | -0.09 | 0.22 | 0.06 | -0.2 | -0.19 | -0.21 | -0.28 |
| **burst rate change** |  |  | -0.61\*\*\* | -0.19 | -0.12 | 0.15 | -0.43\*\* | -0.22 | 0.2 | 0.2 | 0.2 | 0.39\*\* |
| **mean burst** |  |  |  | 0.33. | 0.21 | -0.09 | 0.6\*\*\* | 0.36. | -0.18 | -0.21 | -0.22 | -0.37\*\* |
| **total nematodes** |  |  |  |  | 0.97\*\*\* | 0.63\*\*\* | 0.25 | 0.54\*\* | 0.06 | 0.07 | 0.06 | 0.33. |
| **bacterivores** |  |  |  |  |  | 0.61\*\*\* | 0.03 | 0.54\*\* | 0.08 | 0.01 | 0.01 | 0.42\*\* |
| **fungivores** |  |  |  |  |  |  | -0.19 | 0.48\*\* | -0.07 | 0.75\*\*\* | 0.72\*\*\* | 0.45\*\* |
| **herbivores** |  |  |  |  |  |  |  | -0.05 | -0.05 | -0.18 | -0.18 | -0.36. |
| **omnivores** |  |  |  |  |  |  |  |  | -0.12 | 0.2 | 0.18 | 0.22 |
| **predators** |  |  |  |  |  |  |  |  |  | -0.08 | -0.08 | -0.08 |
| **FF/BF** |  |  |  |  |  |  |  |  |  |  | 0.99\*\*\* | 0.13 |
| **FF/(FF+BF)** |  |  |  |  |  |  |  |  |  |  |  | 0.12 |

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Table S4. Curve fits for path (Figure 3) relationships. SOM= soil organic matter, SWC= soil water content, EC= electrical conductivity, M3= Mehlich-3 extractable forms, Fe= iron, Al= aluminium. Curves fitted for z-score transformed data.

|  |  |  |
| --- | --- | --- |
|  | Mineral soil | Organic soil |
| Relationship(x-y) | Best fit | R2 | Best fit | R2 |
| SOM-SWC | y=1.00x+0.002 | 0.80 | y=0.87x+0.08 | 0.98 |
| EC-SOM | y=0.17x+0.15 | 0.05 | y=1.8x-0.83 | 0.77 |
| EC-pH | y=0.12x-0.27 | 0.02 | y=-1.4x+1.81 | 0.30 |
| pH-mean basal respiration | y=-0.62x-0.32 | 0.64 | y=-3.74x+3.30 | 0.59 |
| pH-mean basal rate change | y=0.65x+0.22 | 0.52 | y=3.33x-2.65 | 0.57 |
| pH-mean burst respiration | y=-0.41x-0.29 | 0.42 | y=1.00x-0.05 | 0.83 |
| pH-mean burst rate change | y=0.37x+0.29 | 0.19 | y=3.17x-2.85 | 0.55 |
| pH-bacterivore abundance | y=0.43x+0.21 | 0.17 | y=1.67x-1.58 | 0.54 |
| pH-fungivore abundance | y=0.27x+0.17 | 0.07 | y=0.67x-0.86 | 0.26 |
| pH-omnivore abundance | y=0.09x+0.17 | 0.01 | y=-0.06x-0.52\* | 0.84 |
| pH-herbivore abundance | y=0.03x-0.58\* | 0.13 | y=1.08x-0.84 | 0.23 |
| SOM-mean basal respiration | y=0.8x-0.04 | 0.55 | y=0.88x+0.07 | 0.92 |
| SOM-mean basal rate change | y=-1.16x-0.14 | 0.87 | y=-0.82x+0.24 | 0.95 |
| SOM-mean burst respiration | y=0.74x-0.07 | 0.71 | y=1.00x-0.05 | 0.83 |
| SOM-mean burst rate change | y=-0.99x+0.02 | 0.72 | y=-0.71x-0.15 | 0.78 |
| SOM-bacterivore abundance | y=-0.35x+0.05 | 0.06 | y=-0.38x-0.14 | 0.78 |
| SOM-fungivore abundance | y=-0.31x+0.06 | 0.04 | y=-0.17x-0.28 | 0.48 |
| SOM-omnivore abundance | y=0.07+0.16 | 0.00 | y=0.36x2-0.84x-0.80 | 0.91 |
| pH-M3Fe | y=-0.73x-0.12 | 0.54 | y=2.36x-1.80 | 0.49 |
| pH-M3Al | y=0.42x+0.43 | 0.38 | y=2.88x-3.18 | 0.57 |
| M3Fe-mean basal respiration | y=0.57x-0.21 | 0.53 | y=-1.30x+0.48 | 0.80 |
| M3Fe-Mean basal rate change | y=-0.47x+0.10 | 0.28 | y=1.23x-0.13 | 0.89 |
| M3Fe-Mean burst respiration | y=0.32x-0.22 | 0.26 | y=-1.55x+0.41 | 0.80 |
| M3Fe-mean burst rate change | y=-0.11x+0.21 | 0.02 | y=1.07x-0.47 | 0.73 |
| M3Fe-bacterivore abundance | y=-0.34x+0.13 | 0.11 | y=0.61x-0.31 | 0.81 |
| M3Fe-fungivore abundance | y=0.29x+0.13 | 0.07 | y=0.27x-0.35 | 0.48 |
| M3Fe-omnivore abundance | y=0.11x+0.15 | 0.01 | y=-0.04x-0.31\* | 0.32 |
| M3Fe-herbivores abundance | y=0.03x-0.58\* | 0.13 | y=0.44x-0.02 | 0.45 |
| M3Al-mean basal respiration | y=-0.74x+0.06 | 0.42 | y=-1.13x-0.64 | 0.78 |
| M3Al-mean basal rate change | y=1.06x-0.27 | 0.64 | Y=1.10x+0.96 | 0.91 |
| M3Al-mean burst respiration | y=-0.63+0.01 | 0.46 | y=-1.39x-0.96 | 0.82 |
| M3Al-mean burst rate change | y=0.50x+0.04 | 0.17 | y=0.97x+0.49 | 0.76 |
| M3Al-bacterivore abundance | y=-0.02x+0.29\* | 0.06 | y=0.56x+0.24 | 0.88 |
| M3Al-fungivore abundance | y=0.35x+0.003 | 0.05 | y=0.22x-0.14 | 0.41 |
| M3Al-omnivore abundance | y=-0.63x+0.23 | 0.16 | y=0.36x+0.33 | 0.28 |
| M3Al-herbivore abundance | y=-0.24x+0.23 | 0.02 | y=0.04x-0.45 | 0.04 |
| \*Outlier removed to obtain best fit |

Table S5. Linear regressions on z-score transformed data for the interactions between functional parameters (nematode abundances and mean respiration parameters).

|  |  |  |
| --- | --- | --- |
|  | Organic soil | Mineral soil |
| Relationship (y-x) | Linear regression equation and significance | R2 | Linear regression equation and significance | R2 |
| mean basal respiration-bacterivore abundance | y=-0.03-1.71x\*\* | 0.64 | y=-0.166-0.20x | 0.07 |
| mean basal respiration-fungivore abundance | y=-0.39-2.64x\* | 0.49 | y=-0.17-0.13x | 0.03 |
| mean basal respiration-herbivore abundance | y=0.49-1.91x\*\* | 0.76 | y=-0.19+0.03x | 0.00 |
| mean basal respiration-omnivore abundance | y=-0.17-1.62x | 0.07 | y=-0.18-0.09x | 0.01 |
| mean basal respiration-predator abundance | y=0.44-1.02x | 0.07 | y=-0.19-0.06x | 0.01 |
| mean basal respiration rate change-bacterivore abundance | y=0.41+1.76x\*\*\* | 0.83 | y=0.06+0.20x | 0.04 |
| mean basal respiration rate change-fungivore abundance | y=0.60+2.25x. | 0.44 | y=0.06+0.19x | 0.05 |
| mean basal respiration rate change-herbivore abundance | y=-0.16+1.48\* | 0.56 | y=0.09-0.23x | 0.07 |
| mean basal respiration rate change-omnivore abundance | y=0.15+0.85 | 0.02 | y=0.09-0.07 | 0.01 |
| mean basal respiration rate change-predator abundance | y=-0.17+0.56 | 0.03 | y=0.08+0.10 | 0.02 |
| mean burst respiration-bacterivore abundance | y=-0.25-2.18x\*\* | 0.72 | y=-0.19-0.11x | 0.03 |
| mean burst respiration-fungivore abundance | y=-0.50-2.82x. | 0.40 | y=-0.19-0.11x | 0.03 |
| mean burst respiration-herbivore abundance | y=0.45-1.79x\* | 0.46 | y=-0.21+0.12x | 0.04 |
| mean burst respiration-omnivore abundance | y=0.01-1.17x | 0.02 | y=-0.21+0.01x | 0.00 |
| mean burst respiration-predator abundance | y=0.44-0.82x | 0.03 | y=-0.20-0.05x | 0.01 |
| mean burst respiration rate change-bacterivore abundance | y=-0.01+1.52x\*\* | 0.66 | y=0.19+0.13x | 0.03 |
| mean burst respiration rate change-fungivore abundance | y=0.17+1.97x. | 0.36 | y=0.19+0.13x | 0.03 |
| mean burst respiration rate change-herbivore abundance | y=-0.49+1.31x\* | 0.47 | y=0.21-0.09x | 0.01 |
| mean burst respiration rate change-omnivore abundance | y=-0.13+0.93x | 0.03 | y=0.21-0.01x | 0.00 |
| mean burst respiration rate change-predator abundance | y=-0.47+0.64x | 0.04 | y=0.20+0.06x | 0.01 |
| .P<0.10, \*P≤0.05, \*\*P≤0.01, \*\*\*P≤0.001 |

Table S6. 95% confidence (± the mean) for soil properties and functional parameters of treatments. SWC= soil water contest, EC= electrical conductivity, SOM= soil organic matter, P= phosphorus, Ca= calcium, Mg= magnesium, K= potassium, Fe= iron, Cu= copper, Mn= manganese, Zn= zinc, B= boron, Na= sodium, Al= aluminium, S= sulfur, FF= fungivore abundance, BF= bacterivore abundance, PF= herbivore abundance. Soil cations are Mehlich-3 extractable forms. Means can be found in Table 2 and Table 3.

|  |  |
| --- | --- |
|  | 95% confidence (± the mean) |
|  | Natural | Unpulverized | Pulverized |
| Parameter | Organic | Luvisol | Podzol | Organic | Luvisol | Podzol | Organic | Luvisol | Podzol |
| Clay |  |  |  | 6.2 | 6.2 | 3.5 | 4.3 | 6.2 | 1.4 |
| Sand |  |  |  | 12.5 | 6.2 | 7.2 | 9.0 | 10.0 | 1.3 |
| SWC | 4.8 | 20.0 | 18.7 | 0.8 | 0.3 | 8.3 | 2.4 | 8.2 | 2.3 |
| pH | 0.8 | 0.1 | 0.3 | 0.1 | 0.4 | 0.2 | 0.1 | 0.5 | 0.3 |
| EC | 89.7 | 14.3 | 78.1 | 32.0 | 20.2 | 51.3 | 27.4 | 71.7 | 17.3 |
| SOM | 4.0 | 45.7 | 23.7 | 15.5 | 0.7 | 5.8 | 0.9 | 2.8 | 1.0 |
| Citric acid P | 114.1 | 21.6 | 4.9 | 6.0 | 20.2 | 35.8 | 9.3 | 56.2 | 29.4 |
| Water extractable P | 3.7 | 12.3 | 0.4 | 9.4 | 0.1 | 0.5 | 4.0 | 0.2 | 0.1 |
| Mehlich-3 P | 8.6 | 20.4 | 2.6 | 248.7 | 0.5 | 43.6 | 188.6 | 20.2 | 6.5 |
| Ca | 919.2 | 48.9 | 39.9 | 590.1 | 254.7 | 303 | 618.1 | 288 | 204.1 |
| Mg | 677.9 | 83.8 | 50.8 | 114.8 | 102.2 | 30.8 | 122.7 | 107.2 | 45.8 |
| K | 12.3 | 64.2 | 19.8 | 9.5 | 4.9 | 5.3 | 4.9 | 65.7 | 42.5 |
| Fe | 18.4 | 148.1 | 28.3 | 37.8 | 66.5 | 37.2 | 38.5 | 10.3 | 23.7 |
| Cu | 1.4 | 1.2 | 0.5 | 0.7 | 0.4 | 0.4 | 0.1 | 1.3 | 0.1 |
| Mn | 1.1 | 1.5 | 5.0 | 1.9 | 5.1 | 6.8 | 3.6 | 5.4 | 1.4 |
| Zn | 10.6 | 1.2 | 0.5 | 10.1 | 0.2 | 4.4 | 2.6 | 1.0 | 0.3 |
| B | 0.3 | 0.3 | 0.0 | 0.2 | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 |
| Na | 3.3 | 18 | 12.2 | 2.0 | 5.3 | 5.8 | 6.2 | 9.2 | 4.8 |
| Al | 1.4 | 691.2 | 241.5 | 177.7 | 116.1 | 161.4 | 190.7 | 146.1 | 67.4 |
| S | 6.1 | 2.6 | 5.2 | 4.4 | 0.3 | 2.6 | 3.5 | 1.7 | 1.7 |
| Mean basal rate change | 10.0 | 17.8 | 35.8 | 2.4 | 4.2 | 7.4 | 10.4 | 2.7 | 1.4 |
| Mean basal respiration | 37.4 | 74.3 | 94.4 | 3.4 | 2.7 | 13.5 | 46.9 | 13.4 | 4.9 |
| Mean burst rate change | 230.6 | 1728.5 | 103.1 | 12.1 | 5.7 | 32.1 | 22.6 | 13.7 | 8.8 |
| Mean burst respiration | 437.5 | 803.7 | 135.4 | 23.5 | 5.8 | 52.4 | 18.0 | 44.6 | 10.2 |
| Total nematode abundance | 8.0 | 450.4 | 451.4 | 134.0 | 218.6 | 765.0 | 344.9 | 515.4 | 528.6 |
| Bacterivore abundance | 10.0 | 260.5 | 360.6 | 149.3 | 46.2 | 740.4 | 356.4 | 493.1 | 405.2 |
| Fungivore abundance | 1.0 | 56.9 | 56.8 | 115.5 | 27.7 | 99.5 | 77.8 | 78.5 | 143.9 |
| Herbivore abundance | 8.3 | 167.4 | 123.8 | 51.7 | 159.8 | 267.6 | 60.6 | 110.3 | 13.8 |
| Omnivore abundance | 0.3 | 8.8 | 6.5 | 9.9 | 8.2 | 12.7 | 0.0 | 14.2 | 7.4 |
| Predator abundance | 1.4 | 10.8 | 12.4 | 19.8 | 8.2 | 20.1 | 0.0 | 14.2 | 2.3 |
| FF/BF | 0.04 | 0.09 | 0.11 | 0.17 | 0.09 | 0.02 | 0.07 | 0.05 | 0.09 |
| FF/(FF+BF) | 0.04 | 0.07 | 0.09 | 0.14 | 2.91 | 0.02 | 0.07 | 0.04 | 0.06 |
| (FF+BF)/PF | 3.39 | 1.46 | 9.87 | 0.77 | 1.17 | 38.17 | 5.35 | 103.96 | 38.36 |