

Appendix S4: Results of MCOA performed on plant functional traits, microbial properties, abiotic soil parameters and ecosystem properties. Loadings of the first two axes of the common structure in unfertilized mesocosms and fertilized mesocosms for France. The length of arrows is proportional to the contribution of a given variable to the common structure.

Abbreviations: Ecosystem properties are represented by red arrows (aboveground biomass (ABM), root biomass (RM), plant digestibility (Digest), soil microbial biomass N (MBN), potential of leached nitrate (leachN), potential nitrogen mineralization (PNM), soil organic matter content (SOM)). Plant, microbial and soil variables are represented by black arrows (soil water filled pore space (WFPS) soil porosity (Poro), total soil nitrogen (soil N), total soil carbon (soil C), soil ammonium content ( $\text{NH}_4^+$ ), in situ nitrate absorbed in resin ( $\text{NO}_3^-$  sorption), vegetative height (Vegetative Height), leaf C content (LCC), root dry matter content (RDMC), root N content (RNC), root C:N ratio (Root C.N), gene abundance of ammonium mono-oxygenase gene *amoA* for archaea (AOA), gene abundance of nitrite reductase *nirS* (*nirS*), potential denitrification enzyme activity (DEA), intensity of mycorrhization (Mycor) and fungi to bacteria ratio (F.B ratio).

