Supporting information

Appendix C1: (a) The soil pools of nitrate (NO_3^-), ammonium (NH_4^+) and (b) microbial biomass N in the upper 10 cm of each land use type prior to inoculation. (c) Plant nitrogen (N) and (d) plant biomass. Data from four 200-cm^2 areas per fields were amalgamated to give mean values of three fields per land use ± 1SE. Different letters within groups represent $p < 0.05$.

	Terraced		Unterraced	
	Mown	Unmown	Mown	Unmown
a) Soil N pools				
$N\text{-}NO_3^-$ (µg $N.g^{-1}$ soil)	3.7 ± 1.3^{B}	8.3 ± 0.9^{A}	0.2 ± 0.01^{C}	1.1 ± 0.3^{BC}
$N\text{-}NO_3^-$ (mg $N.m^{-2}$ area)	458.1 ± 161.3^{B}	1073.8 ± 125.8^{A}	24.1 ± 5.9^{C}	121.8 ± 33.8^{BC}
$N\text{-}NH_4^+$ (µg $N.g^{-1}$ soil)	21.7 ± 2.1^{A}	15.7 ± 1.7^{A}	12.9 ± 2.1^{A}	22.1 ± 4.8^{A}
$N\text{-}NH_4^+$ (mg $N.m^{-2}$ area)	2646.3 ± 261.6^{A}	2595.1 ± 227.3^{AB}	1382.1 ± 214.8^{B}	2595.1 ± 563.7^{A}
$N\text{-}NH_4^+$ / $N\text{-}NO_3^-$ ratio	8.5 ± 3.9^{B}	1.9 ± 0.3^{C}	59.3 ± 2.3^{A}	25.4 ± 7.8^{A}
b) Microbial N pools				
Microbial biomass N (µg $N.g^{-1}$ soil)	150.4 ± 16.9^{A}	117.7 ± 29.8^{A}	137.5 ± 27.7^{A}	164.1 ± 17.1^{A}
Microbial biomass N (g $N.m^{-2}$ area)	18.3 ± 2.1^{A}	15.1 ± 3.8^{A}	14.6 ± 2.9^{A}	19.2 ± 2.0^{A}
Microbial C : N ratio	6.4 ± 0.2^{A}	7.2 ± 0.2^{A}	5.1 ± 0.1^{B}	4.8 ± 0.2^{B}
c) Plant N pools				
Above-ground plant (mg $N.g^{-1}$ biomass)	20.1 ± 1.8^{A}	20.8 ± 2.5^{A}	21.6 ± 1.5^{A}	24.2 ± 1.2^{A}
Above-ground plant (g $N.m^{-2}$ area)	3.9 ± 0.8^{C}	4.5 ± 0.8^{BC}	7.2 ± 0.6^{AB}	10.0 ± 1.3^{A}
Root (mg $N.g^{-1}$ biomass)	11.9 ± 1.1^{AB}	12.8 ± 0.8^{A}	8.4 ± 1.0^{BC}	6.3 ± 1.2^{C}
Root (g $N.m^{-2}$ area)	9.3 ± 1.1^{A}	5.6 ± 0.2^{A}	9.4 ± 1.9^{A}	8.1 ± 1.1^{A}
d) Plant Biomass				
Above-ground plant biomass (g.m^{-2} area)	193.9 ± 32.7^{B}	230.4 ± 67.6^{B}	338.9 ± 28.5^{AB}	413.2 ± 54.4^{A}
Relative growth rate (mg.g^{-1}.d^{-1})	82.5 ± 18.7^{A}	94.5 ± 29.6^{A}	36.5 ± 7.0^{B}	24.5 ± 3.3^{B}
Root biomass (g.m^{-2} area)	784.7 ± 47.7^{B}	446.5 ± 46.2^{C}	1102.6 ± 91.0^{A}	1311.0 ± 115.5^{A}

Appendix C2: (a) Soil nitrogen (N) flux per day, calculated using the ^{15}N pool dilutions for 48 h after inoculation from the isotope dilution equations of Kirkham & Bartholomew. (b) Microbial N uptake, and (c, d) plant N uptake per day, calculated for the same period using the ^{15}N pool dilution equations of described in Stark (2010). Data from four 200-cm^2 areas per fields were amalgamated to give mean values of three fields per land use ± 1SE. Different letters within groups represent $p < 0.05$.

	Terraced		Unterraced	
	Mown	Unmown	Mown	Unmown
a) Soil N flux				
Gross N-NO_3^- consumption rate (µg N.g^{-1} soil.day^{-1})	28.3 ± 6.7^{A}	16.8 ± 6.3^{A}	17.25± 4.5^{A}	19.0 ± 4.9^{A}
Gross N-NO_3^- consumption rate (mg N.m^{-2} .day^{-1})	3448 ± 818^{A}	2162 ± 816^{A}	1835 ± 480^{A}	2232 ± 586^{A}
Gross N-NH_4^+ consumption rate (µg N.g^{-1} soil.day^{-1})	22.3 ± 4.2^{A}	16.7 ± 3.1^{AB}	8.6 ± 1.1^{B}	9.9 ± 2.1^{B}
Gross N-NH_4^+ consumption rate (mg N.m^{-2} .day^{-1})	2719 ± 519^{A}	2158 ± 405^{AB}	917 ± 116^{B}	1165 ± 242^{B}
b) Microbial N uptake				
Specific N uptake rate per g soil (µg N.g^{-1} biomass.day^{-1})	66.7 ± 6.9^{A}	58.7 ± 4.9^{A}	48.76± 13.1^{A}	55.8 ± 8.1^{A}
Gross N uptake rate per field area (mg N.m^{-2} area)	2144.5 ± 624.9^{A}	956.5 ± 153.9^{A}	1109.5 ± 198.1^{A}	1202.6 ± 372.5^{A}
c) Plant N translocation to shoot				
Specific N uptake rate (mg N.g^{-1} biomass. day^{-1})	19.2 ± 0.9^{AB}	28.7 ± 3.6^{A}	26.5 ± 13.4^{A}	14.9 ± 1.5^{B}
N uptake rate per field area (mg N.m^{-2}. day^{-1})	2401.7 ± 1103.7^{AB}	3812.2 ± 438.3^{A}	1545.3 ± 87.5^{B}	1550.5 ± 437.9^{B}
d) Plant root N uptake				
Specific N uptake rate (mg N.g^{-1} biomass. day^{-1})	1.8 ± 0.5^{BC}	4.3 ± 0.3^{A}	2.8 ± 0.5^{B}	1.0 ± 0.3^{C}
N uptake rate per field area (g N.m^{-2}. day^{-1})	456.3 ± 183.3^{AB}	718.2 ± 115.2^{A}	443.8 ± 27.2^{AB}	240.8 ± 43.2^{B}