# Supplementary Materials: Short-Term Response of Sasa Dwarf Bamboo to a Change of Soil Nitrogen Fertility in a Forest Ecosystem in Northern Hokkaido, Japan

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**Table S1.** Data of aboveground- and belowground-biomass, and their N concentrations in control, low-, and high-N plots before-N addition with the *P* values of the one-way ANOVA among plots in each category.

| Category | Control plot | | Low–N plot | | High–N plot | | One–way ANOVA |
|---|---|---|---|---|---|---|---|
| | mean | SD | mean | SD | mean | SD | *P* value |
| Total aboveground biomass (g DW m–2) | 1733 | 466 | 1931 | 863 | 1607 | 322 | ns |
| Total aboveground biomass N (g N m–2) | 14.9 | 3.8 | 15.7 | 7.0 | 13.4 | 2.6 | ns |
| Total leaf number (number $m^{-2}$) | 455 | 167 | 492 | 248 | 416 | 91 | ns |
| Total leaf biomass (g DW $m^{-2}$) | 427 | 69 | 432 | 169 | 381 | 85 | ns |
| Total leaf biomass N (g N $m^{-2}$) | 8.6 | 1.8 | 8.6 | 3.6 | 6.8 | 1.2 | ns |
| Current leaf number (number $m^{-2}$) | 195 | 82 | 168 | 77 | 138 | 31 | ns |
| Current leaf biomass (g DW $m^{-2}$) | 167 | 41 | 147 | 51 | 80 | 26 | ns |
| Current leaf biomass N (g N $m^{-2}$) | 3.9 | 0.7 | 3.5 | 1.3 | 2.6 | 0.4 | ns |
| Previous leaf number (number $m^{-2}$) | 260 | 110 | 324 | 173 | 278 | 87 | ns |
| Previous leaf biomass (g DW $m^{-2}$) | 261 | 45 | 285 | 118 | 251 | 71 | ns |
| Previous leaf biomass N (g N $m^{-2}$) | 4.7 | 1.4 | 5.2 | 2.3 | 4.1 | 1.0 | ns |
| Total culm number (number $m^{-2}$) | 157 | 73 | 203 | 81 | 145 | 27 | ns |
| Total culm biomass (g DW $m^{-2}$) | 1305 | 409 | 1499 | 701 | 1226 | 257 | ns |
| Total culm biomass N (g N $m^{-2}$) | 6.3 | 2.2 | 7.1 | 3.5 | 6.6 | 1.8 | ns |
| Current culm number (number $m^{-2}$) | 45 | 13 | 40 | 19 | 36 | 13 | ns |
| Current culm biomass (g DW $m^{-2}$) | 266 | 96 | 205 | 98 | 200 | 87 | ns |
| Current culm biomass N (g N $m^{-2}$) | 2.0 | 0.5 | 1.6 | 0.9 | 1.5 | 0.7 | ns |
| Previous culm number (number $m^{-2}$) | 112 | 70 | 163 | 62 | 109 | 29 | ns |
| Previous culm biomass (g DW $m^{-2}$) | 1040 | 423 | 1293 | 618 | 1025 | 253 | ns |
| Previous culm biomass N (g N $m^{-2}$) | 4.3 | 2.7 | 5.4 | 2.7 | 5.0 | 1.6 | ns |
| Current leaf N concentration (mg $g^{-1}$) | 23.7 | 2.2 | 23.4 | 1.8 | 20.8 | 1.0 | ns |
| Current culm N concentration (mg $g^{-1}$) | 7.9 | 1.8 | 7.3 | 1.5 | 7.6 | 0.5 | ns |
| Previous leaf N concentration (mg $g^{-1}$) | 17.1 | 2.0 | 17.6 | 2.1 | 16.6 | 1.4 | ns |
| Previous culm N concentration (mg $g^{-1}$) | 4.4 | 1.3 | 4.6 | 0.4 | 5.1 | 1.2 | ns |
| Total belowground biomass (g DW $m^{-2}$) | 322 | 185 | 545 | 308 | 688 | 146 | ns |
| Total belowground biomass N (g N $m^{-2}$) | 3.2 | 2.0 | 4.6 | 2.6 | 5.5 | 1.1 | ns |
| Fine root N concentration in 0-15 cm depth (mg $g^{-1}$) | 10.6 | 1.8 | 9.9 | 0.7 | 9.9 | 0.9 | ns |
| Fine root N concentration in 15-30 cm depth (mg $g^{-1}$) | 9.7 | 2.8 | 8.2 | 0.8 | 8.5 | 0.4 | ns |
| Soil inorganic N ($NH_4^+$ and $NO_3^-$) amount (g $m^{-2}$) | 5.11 | 0.95 | 4.10 | 1.39 | 3.50 | 1.18 | ns |

ns means no significant.

**Table S2.** Data of aboveground- and belowground-biomass, and their N concentrations in control, low-, and high-N plots after N addition with the *P* values of the two-way ANOVA (year, N amount, and the interaction).

| Year | Control plot | | | Low–N plot | | | High–N plot | | | Two–way ANOVA | *P* value |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | mean | SD | | mean | SD | | mean | SD | | | |
| Total aboveground biomass (g DW m$^{-2}$) | | | | | | | | | | | |
| 1year After | 1290 | 556 | aA[(1)] | 1257 | 633 | aA | 2060 | 1238 | aA | Year (Y) | ns |
| 2year After | 979 | 676 | abA | 981 | 281 | bA | 2325 | 861 | aA | Treatment (T) | <0.05 |
| | | | | | | | | | | Interaction T × Y | ns |
| Total aboveground biomass N (g N m$^{-2}$) | | | | | | | | | | | |
| 1year After | 10.2 | 3.5 | aA | 9.3 | 5.2 | aA | 19.1 | 10.9 | aA | Year (Y) | ns |
| 2year After | 11.2 | 6.9 | abA | 8.5 | 2.8 | bA | 21.4 | 6.4 | aA | Treatment (T) | <0.01 |
| | | | | | | | | | | Interaction T × Y | ns |
| Total culm number (number m$^{-2}$) | | | | | | | | | | | |
| 1year After | 101 | 45 | aA | 114 | 61 | aA | 178 | 103 | aA | Year (Y) | ns |
| 2year After | 84 | 59 | bA | 90 | 39 | bA | 238 | 49 | aA | Treatment (T) | <0.01 |
| | | | | | | | | | | Interaction T × Y | ns |
| Total culm biomass (g DW m$^{-2}$) | | | | | | | | | | | |
| 1year After | 969 | 423 | aA | 960 | 446 | aA | 1464 | 927 | aA | Year (Y) | ns |
| 2year After | 761 | 569 | aA | 776 | 228 | aA | 1814 | 697 | aA | Treatment (T) | ns |
| | | | | | | | | | | Interaction T × Y | ns |
| Total culm biomass N (g N m$^{-2}$) | | | | | | | | | | | |
| 1year After | 4.1 | 0.9 | aA | 3.8 | 1.0 | aA | 7.7 | 4.9 | aA | Year (Y) | ns |
| 2year After | 6.8 | 5.2 | aA | 4.6 | 1.6 | aA | 10.6 | 3.0 | aA | Treatment (T) | ns |
| | | | | | | | | | | Interaction T × Y | ns |
| Current culm number (number m$^{-2}$) | | | | | | | | | | | |
| 1year After | 15 | 11 | aA | 20 | 28 | aA | 32 | 20 | aA | Year (Y) | ns |
| 2year After | 32 | 17 | abA | 19 | 15 | bA | 59 | 16 | aA | Treatment (T) | <0.05 |
| | | | | | | | | | | Interaction T × Y | ns |
| Current culm biomass (g DW m$^{-2}$) | | | | | | | | | | | |
| 1year After | 85 | 43 | aA | 71 | 87 | aA | 140 | 93 | aA | Year (Y) | ns |
| 2year After | 302 | 175 | aA | 220 | 174 | aA | 343 | 262 | aA | Treatment (T) | ns |
| | | | | | | | | | | Interaction T × Y | ns |
| Current culm biomass N (g N m$^{-2}$) | | | | | | | | | | | |
| 1year After | 0.6 | 0.3 | aB | 0.4 | 0.5 | aA | 1.0 | 0.7 | aA | Year (Y) | <0.05 |
| 2year After | 3.5 | 2.4 | aA | 1.9 | 1.4 | aA | 3.0 | 1.5 | aA | Treatment (T) | ns |
| | | | | | | | | | | Interaction T × Y | ns |
| Previous culm number (number m$^{-2}$) | | | | | | | | | | | |
| 1year After | 86 | 35 | aA | 94 | 37 | aA | 146 | 83 | aA | Year (Y) | ns |
| 2year After | 52 | 45 | bA | 71 | 32 | bA | 179 | 47 | aA | Treatment (T) | <0.01 |
| | | | | | | | | | | Interaction T × Y | ns |
| Previous culm biomass (g DW m$^{-2}$) | | | | | | | | | | | |
| 1year After | 883 | 386 | aA | 889 | 389 | aA | 1324 | 836 | aA | Year (Y) | ns |
| 2year After | 458 | 397 | bA | 556 | 183 | bA | 1471 | 477 | aA | Treatment (T) | <0.05 |
| | | | | | | | | | | Interaction T × Y | ns |

**Table S2.** *Cont.*

| Year | Control plot | | | Low–N plot | | | High–N plot | | | Two–way ANOVA | *P* value |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | mean | SD | | mean | SD | | mean | SD | | | |
| Previous culm biomass N (g N m$^{-2}$) | | | | | | | | | | | |
| 1year After | 3.5 | 0.7 | aA | 3.4 | 0.7 | aA | 6.7 | 4.2 | aA | Year (Y) | ns |
| 2year After | 3.3 | 2.8 | bA | 2.7 | 0.6 | bA | 7.6 | 1.6 | aA | Treatment (T) | <0.01 |
| | | | | | | | | | | Interaction T × Y | ns |
| Current leaf N concentration (mg g$^{-1}$) | | | | | | | | | | | |
| 1year After | 21.6 | 1.8 | aA | 21.1 | 1.9 | aA | 22.4 | 0.9 | aA | Year (Y) | ns |
| 2year After | 23.9 | 1.7 | aA | 23.2 | 1.0 | aA | 23.4 | 1.4 | aA | Treatment (T) | ns |
| | | | | | | | | | | Interaction T × Y | ns |
| Current culm N concentration (mg g$^{-1}$) | | | | | | | | | | | |
| 1year After | 6.8 | 0.8 | aB | 5.4 | 0.1 | aB | 7.4 | 0.6 | aB | Year (Y) | <0.05 |
| 2year After | 10.6 | 2.5 | aA | 8.8 | 1.9 | aA | 9.5 | 2.1 | aA | Treatment (T) | ns |
| | | | | | | | | | | Interaction T × Y | <0.05 |
| Previous leaf N concentration (mg g$^{-1}$) | | | | | | | | | | | |
| 1year After | 17.2 | 0.9 | aA | 16.7 | 2.7 | aA | 17.5 | 1.3 | aA | Year (Y) | ns |
| 2year After | 17.1 | 0.0 | aA | 16.7 | 1.0 | aA | 19.7 | 1.5 | aA | Treatment (T) | ns |
| | | | | | | | | | | Interaction T × Y | ns |
| Previous culm N concentration (mg g$^{-1}$) | | | | | | | | | | | |
| 1year After | 4.6 | 1.1 | aB | 4.7 | 0.6 | aA | 5.4 | 0.8 | aA | Year (Y) | <0.05 |
| 2year After | 7.2 | 0.2 | aA | 5.2 | 1.0 | aA | 5.4 | 0.7 | aA | Treatment (T) | ns |
| | | | | | | | | | | Interaction T × Y | ns |
| Total belowground biomass (g DW m$^{-2}$) | | | | | | | | | | | |
| 1year After | 1480 | 1123 | aA | 1269 | 708 | aA | 990 | 645 | aA | Year (Y) | ns |
| 2year After | 681 | 330 | aA | 498 | 245 | aA | 769 | 650 | aA | Treatment (T) | ns |
| | | | | | | | | | | Interaction T × Y | ns |
| Total belowground biomass N (g N m$^{-2}$) | | | | | | | | | | | |
| 1year After | 10.4 | 6.7 | aA | 7.3 | 3.9 | aA | 8.1 | 5.7 | aA | Year (Y) | ns |
| 2year After | 7.3 | 2.8 | aA | 4.6 | 1.9 | aA | 5.6 | 3.5 | aA | Treatment (T) | ns |
| | | | | | | | | | | Interaction T × Y | ns |
| Fine root N concentration in 0-15 cm depth (mg g$^{-1}$) | | | | | | | | | | | |
| 1year After | 10.2 | 1.5 | aA | 9.4 | 2.8 | aA | 9.2 | 1.0 | aA | Year (Y) | ns |
| 2year After | 12.6 | 2.0 | aA | 12.1 | 3.0 | aA | 9.3 | 0.7 | aA | Treatment (T) | ns |
| | | | | | | | | | | Interaction T × Y | ns |
| Fine root N concentration in 15-30 cm depth (mg g$^{-1}$) | | | | | | | | | | | |
| 1year After | 6.4 | 1.6 | aA | 7.6 | 0.4 | aA | 6.5 | 0.7 | aB | Year (Y) | <0.05 |
| 2year After | 8.7 | 1.3 | aA | 7.6 | 1.2 | aA | 8.2 | 1.4 | aA | Treatment (T) | ns |
| | | | | | | | | | | Interaction T × Y | ns |

1year and 2year after means September 2008 and 2009, respectively; (1) Different lower-case letters indicate significant differences among plots in each year ($P < 0.05$, Tukey's HSD). Different capital letters indicate significant differences between years in each plot ($P < 0.05$, *t*-test) in each category; ns means no significant.

**Table S3.** Total littefall amount, N amount, and the N concentrations in leaf and culm litterfall from August 2007 to June 2008 in control, low-, and high-N plots before N addition with *P* values of the one-way ANOVA among plots in each category.

| Category | Control plot | | | Low-N plot | | | High-N plot | | | One-way ANOVA |
|---|---|---|---|---|---|---|---|---|---|---|
| | mean | SD | | mean | SD | | mean | SD | | *P* value |
| Total litterfall amount (g $m^{-2}$) | 98 | 85 | a | 89 | 27 | a | 113 | 62 | a | ns |
| Total litterfall N amount (g $m^{-2}$) | 1.1 | 1.1 | a | 0.8 | 0.2 | a | 1.0 | 0.4 | a | ns |
| Leaf litterfall N concentration (mg $g^{-1}$) | 11.8 | 2.6 | a | 12.1 | 1.8 | a | 11.4 | 1.8 | a | ns |
| Culm litterfall N concentration (mg $g^{-1}$) | 8.2 | 2.5 | a | 4.8 | 0.7 | b | 5.2 | 1.3 | ab | <0.05 |

ns means no significant; Leaf and culm litterfall N concentration shows the weighted-mean N concentration that is calculated by dividing the sum of N mass of the monthly litterfall by total litterfall mass.

**Table S4.** Total littefall amount, N amount, and the N concentrations in leaf and culm litterfall in control, low-, and high-N plots after N addition with *P* values of the two-way ANOVA.

| Year | Control plot | | | Low-N plot | | | High-N plot | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | mean | SD | | mean | SD | | mean | SD | | Two-way ANOVA | *P* value |
| Total litterfall amount (g $m^{-2}$) | | | | | | | | | | | |
| 1year After | 124 | 100 | aA(1) | 152 | 61 | aA | 184 | 34 | aA | Year (Y) | ns |
| 2year After | 148 | 30 | aA | 133 | 86 | aA | 131 | 36 | aA | Treatment (T) | ns |
| | | | | | | | | | | Interaction T × Y | ns |
| Total litterfall N amount (g N $m^{-2}$) | | | | | | | | | | | |
| 1year After | 1.1 | 0.7 | aA | 1.1 | 0.4 | aA | 1.9 | 0.4 | aA | Year (Y) | ns |
| 2year After | 1.3 | 0.2 | aA | 1.2 | 1.0 | aA | 1.0 | 0.1 | aA | Treatment (T) | ns |
| | | | | | | | | | | Interaction T × Y | ns |
| Leaf litterfall N concentration (mg $g^{-1}$) | | | | | | | | | | | |
| 1year After | 13.1 | 1.4 | aA | 14.4 | 0.5 | aA | 14.3 | 2.4 | aA | Year (Y) | ns |
| 2year After | 11.9 | 1.0 | aA | 12.4 | 2.4 | aA | 11.9 | 1.6 | aA | Treatment (T) | ns |
| | | | | | | | | | | Interaction T × Y | ns |
| Culm litterfall N concentration (mg $g^{-1}$) | | | | | | | | | | | |
| 1year After | 4.7 | 1.2 | aA | 3.7 | 0.9 | aA | 4.8 | 0.8 | aA | Year (Y) | ns |
| 2year After | 3.9 | 0.5 | aA | 3.9 | 1.3 | aA | 4.8 | 1.2 | aA | Treatment (T) | ns |
| | | | | | | | | | | Interaction T × Y | ns |

1year and 2 year after means June 2008–2009 and June 2009–2010, respectively; (1) Different lower-case letters indicate significant differences among plots in each year ($P < 0.05$, Tukey's HSD). Different capital letters indicate significant differences between years in each plot ($P < 0.05$, *t*-test) in each category; ns means no significant; Leaf and culm litterfall N concentration shows the weighted-mean N concentration that is calculated by dividing the sum of N mass of the monthly litterfall by total litterfall mass.