



Table S1. Equation parameters of linear regression models between nitrogen (N) concentrations in switchgrass biomass as a function of the amount of N applied in 2008, 2009, and 2010.

| | | Value | Standard Error | t-Value | Prob> t |
|------------------------------|-----------|---------|----------------|----------|----------|
| N (g kg ⁻¹) 2008 | Intercept | 3.09467 | 0.19473 | 15.89243 | 4.44E-16 |
| | Slope | 0.00467 | 0.00139 | 3.37181 | 0.00207 |
| N (g kg ⁻¹) 2009 | Intercept | 3.3276 | 0.15503 | 21.46484 | 0.00E+00 |
| | Slope | 0.00372 | 0.0011 | 3.37022 | 0.00208 |
| N (g kg ⁻¹) 2010 | Intercept | 3.2008 | 0.34572 | 9.25845 | 2.67E-10 |
| | Slope | 0.00549 | 0.00246 | 2.23246 | 0.0332 |

Table S2. Equation parameters between acid detergent fiber (ADF), neutral detergent fiber (NDF), and total digestible nutrients (TDN) and nitrogen application rates in 2009 and 2010.

| | | Value | Standard Error | t-Value | Prob> t |
|------|-----------|-----------|----------------|-----------|----------|
| 2009 | | | | | |
| ADF | Intercept | 560.58879 | 6.56641 | 85.37216 | 0.00E+00 |
| | Slope | 0.22279 | 0.04672 | 4.76902 | 4.47E-05 |
| NDF | Intercept | 857.13504 | 3.98745 | 214.95837 | 0.00E+00 |
| | Slope | 0.07247 | 0.02837 | 2.55475 | 0.01594 |
| TDN | Intercept | 452.30133 | 5.11523 | 88.4224 | 0.00E+00 |
| | Slope | -0.17355 | 0.03639 | -4.76902 | 4.47E-05 |
| 2010 | | | | | |
| ADF | Intercept | 463.2 | 10.46634 | 44.25718 | 3.53E-28 |
| | B1 | 0.79 | 0.20788 | 3.81384 | 6.62E-04 |
| | B2 | -0.003 | 8.50E-04 | -3.09429 | 0.00434 |
| NDF | Intercept | 768.66311 | 6.23575 | 123.26724 | 0.00E+00 |
| | Slope | 0.09045 | 0.04436 | 2.03883 | 0.05036 |
| TDN | Intercept | 479.02614 | 9.53941 | 50.21546 | 0.00E+00 |
| | Slope | -0.1827 | 0.06787 | -2.69201 | 0.0115 |

Table S3. Equation parameters of linear regression models between nitrogen (N) concentrations in switchgrass biomass as a function of accumulated growing degree days (AGDD) in 2008, 2009, and 2010.

| | | Value | Standard Error | t-Value | Prob> t |
|------------------------------|-----------|----------|----------------|----------|----------|
| N (g kg ⁻¹) 2008 | Intercept | 12.25831 | 1.36464 | 8.9828 | 4.53E-08 |
| | Slope | -0.00326 | 6.60E-04 | -4.94581 | 1.04E-04 |
| N (g kg ⁻¹) 2009 | Intercept | 16.47629 | 0.94385 | 17.45639 | 2.24E-14 |
| | Slope | -0.00461 | 4.12E-04 | -11.173 | 1.55E-10 |
| N (g kg ⁻¹) 2010 | Intercept | 10.52159 | 1.05806 | 9.94418 | 9.73E-09 |
| | Slope | -0.00233 | 4.17E-04 | -5.58885 | 2.64E-05 |

Table S4. Equation parameters between acid detergent fiber (ADF), neutral detergent fiber (NDF), and total digestible nutrients (TDN) and accumulated growing degree days (AGDD) in 2008, 2009, and 2010.

| | | Value | Standard Error | t-Value | Prob> t |
|------|-----------|-----------|----------------|-----------|----------|
| 2008 | | | | | |
| ADF | Intercept | 220.3018 | 15.45773 | 14.25188 | 3.02E-11 |
| | Slope | 0.12935 | 0.00748 | 17.29895 | 1.16E-12 |
| NDF | Intercept | 255.56094 | 26.01287 | 9.8244 | 1.17E-08 |
| | Slope | 0.19888 | 0.01258 | 15.80585 | 5.35E-12 |
| TDN | Intercept | 717.37351 | 12.04283 | 59.56853 | 3.95E-22 |
| | Slope | -0.10076 | 0.00583 | -17.29758 | 1.16E-12 |
| 2009 | | | | | |
| ADF | Intercept | 306.69471 | 37.00323 | 8.28832 | 9.05E-07 |
| | Slope | 0.09263 | 0.01769 | 5.2356 | 1.26E-04 |
| NDF | Intercept | 561.37319 | 41.79875 | 13.43038 | 2.18E-09 |
| | Slope | 0.10655 | 0.01998 | 5.33138 | 1.06E-04 |
| TDN | Intercept | 664.83394 | 38.77938 | 17.144 | 8.59E-11 |
| | Slope | -0.09707 | 0.01854 | -5.2356 | 1.26E-04 |
| 2010 | | | | | |
| ADF | Intercept | 398.83343 | 24.21506 | 16.47047 | 2.67E-12 |
| | Slope | 0.05825 | 0.00955 | 6.0998 | 9.19E-06 |
| TDN | Intercept | 578.01027 | 18.92575 | 30.54095 | 5.85E-17 |
| | Slope | -0.0452 | 0.00746 | -6.05643 | 1.00E-05 |