Supplementary Material

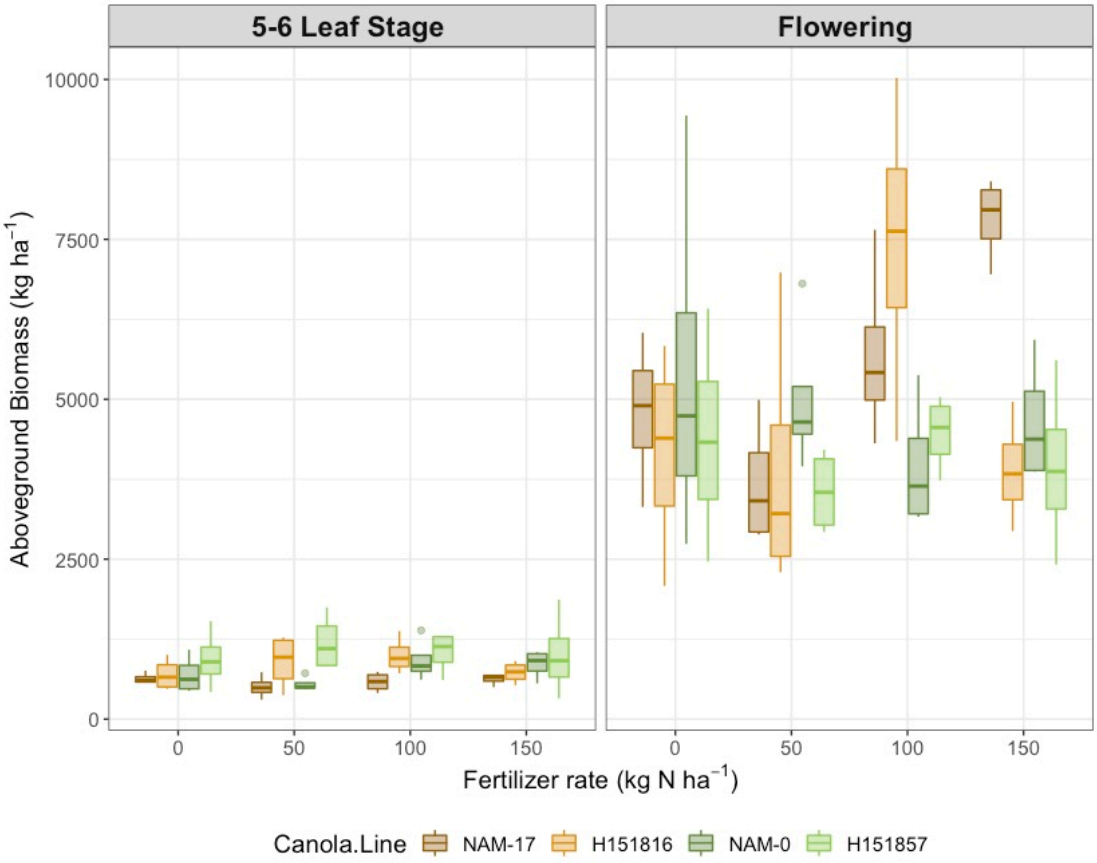

Figure S1| Aboveground plant biomass over four diverse canola varieties and four varying N treatment rates at two phenological growth stages (5-6 leaf stage and flowering, n = 4).

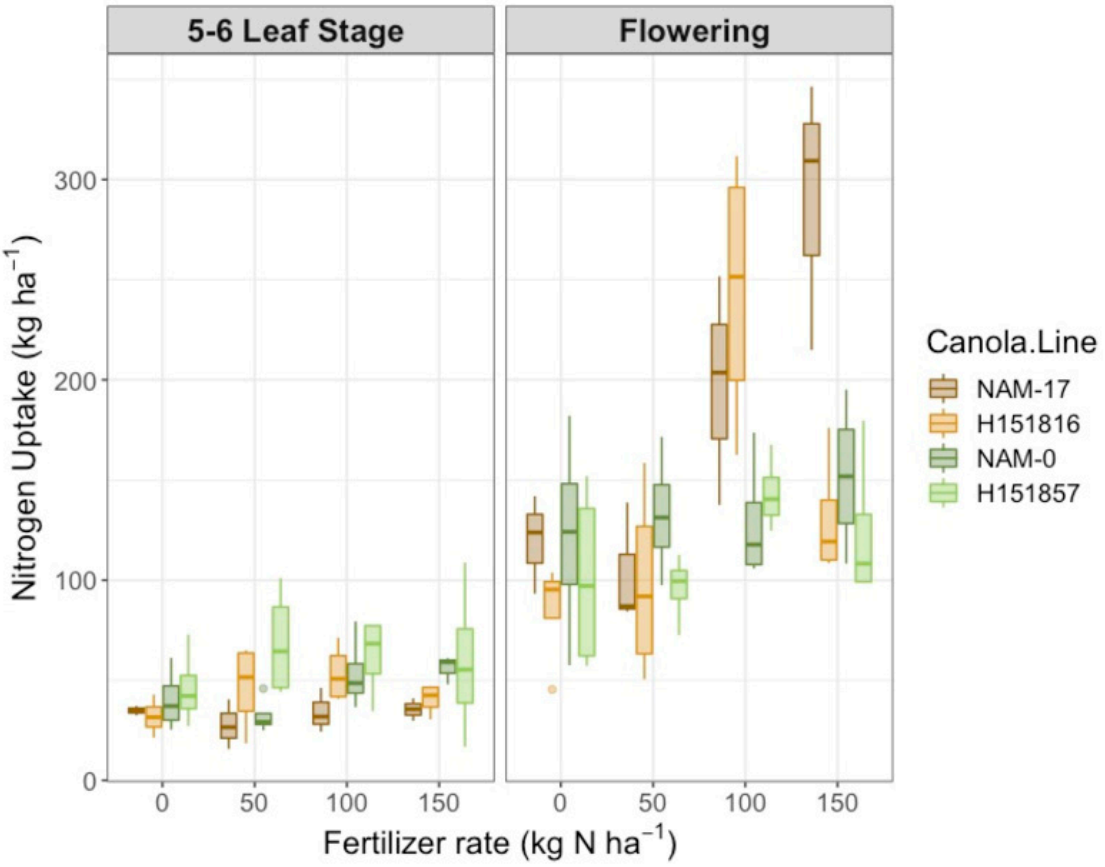

Figure S2| Canola N uptake over four diverse canola varieties and four varying N treatment rates at two phenological growth stages (5-6 leaf stage and flowering, n = 4).

Table S1| Meteorological condition during the canola growing for 2018 season. Meteorological data obtained from Environment and Climate Change Canada https://climate.weather.gc.ca/climate_data.

Growing months in 2018	Broad Sampling stages	Mean daily precipitation (mm)	Mean daily temperature (˚C)
May	Seeding	35.0	14.3
June	5-6 leaf stage	19.9	17.3
July	Flowering	31.1	18.7
August	Physiological maturity	17.2	17.1
September	Harvest maturity	37.1	7.4

Table S2| Physio-chemical properties of study site prior to seeding in 2018.

Variables	Llewellyn Farm 2018
Soil Properties (0-15 cm depth)	
Soil pH	7.3
Organic matter (%)	5.5
Electrical conductivity (dS/m)	0.6
Available N (ppm)[1]	12.0**
Available P (ppm)	23.0**
Available K (ppm)	780.0⇑
Available S (ppm)	8.0•
Available Ca (ppm)	5900.0•
Available Mg (ppm)	960.0•
Available Na (ppm)	27.0⇓
Seeding Factors	
Preceding crop	Wheat
Seeding date	Julian day 147
Emergence rate	30-100% emergence; 51% average emergence
Days to harvest maturity	77-85 day range after seeding; 80 days average

⇓ Deficient, ** Marginal, • Optimum, ⇑ Excess in relation to fertility recommendations for optimal yield. [1]Available N was examined at two depths pre-seeding, with 12 ppm (26.9 kg ha^{-1}) available N at the 0-15 cm depth and 8 ppm (56.0 kg ha^{-1}) at the 15-60 cm depth.

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