

## Aberystwyth University

### *Latitudinal variation In ambient UV-B radiation is an important determinant of Lolium perenne forage production, quality, and digestibility*

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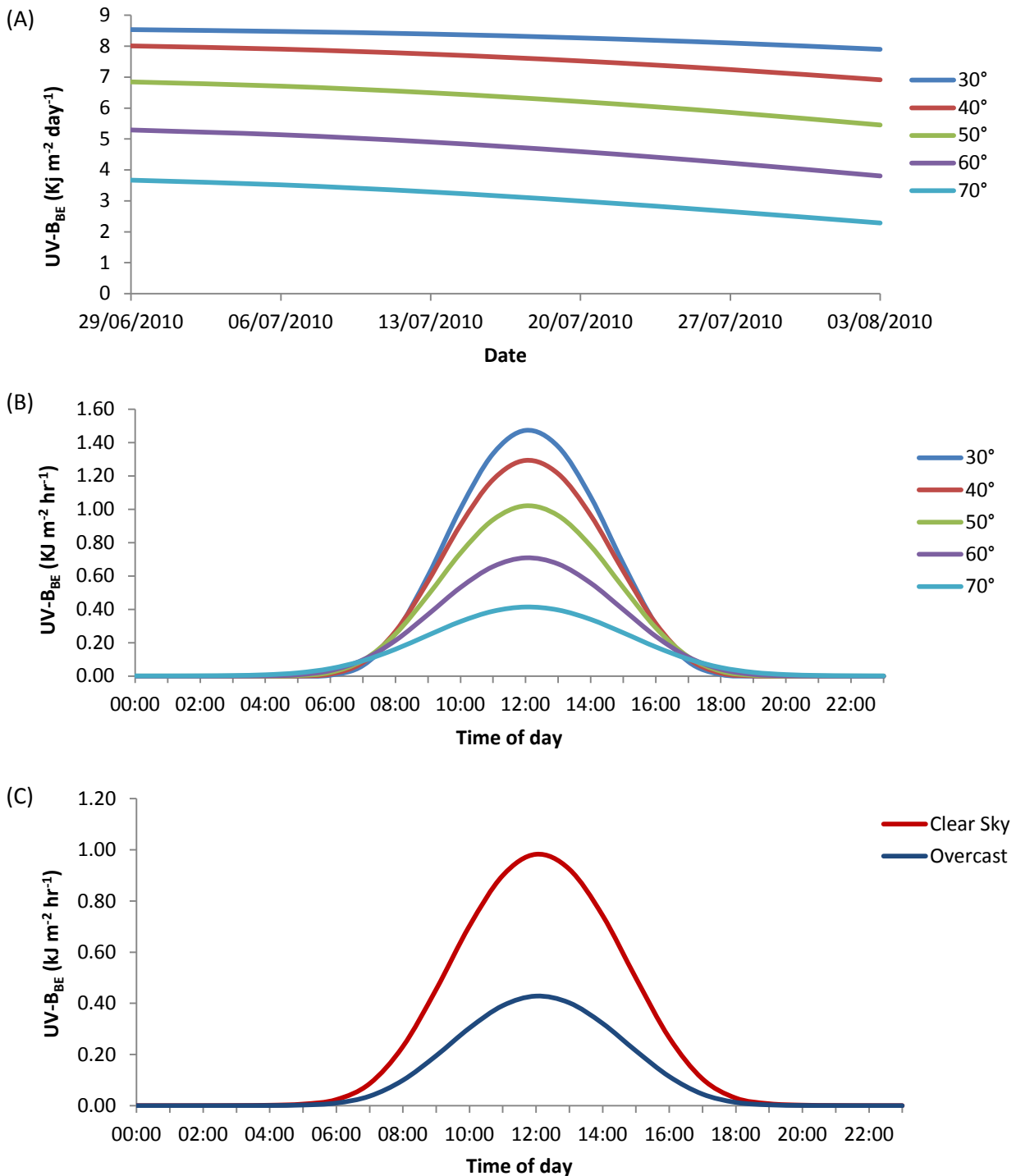
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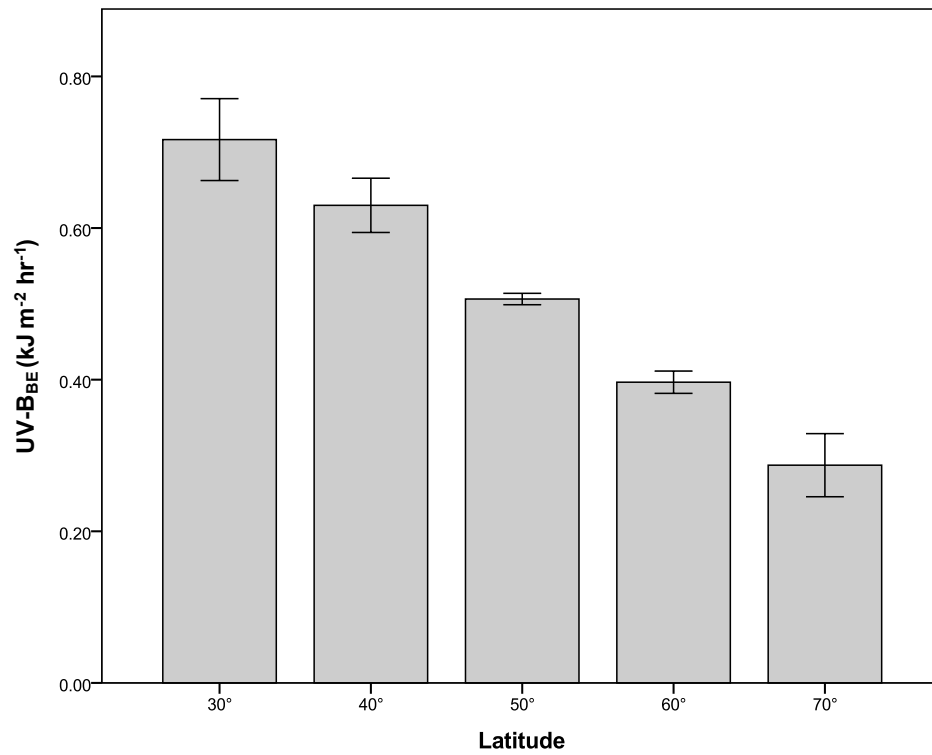
**Latitudinal variation in ambient UV-B radiation is an important determinant of *Lolium perenne* forage production, quality and digestibility.** David Comont, Ana Winters, Simon McQueen-Mason, Leonardo Gomez, and Dylan Gwynn-Jones

Supplementary data



**Figure S1: Modelled biologically effective UV-B (UV-B<sub>BE</sub>) irradiance data created using the ACD: TUV model. (A) Daily total UV-B<sub>BE</sub> from the 29/06/2010 – 03/08/2010 at latitudes between 30 – 70 °N under clear sky conditions. (B) Change in mean hourly UV-B<sub>BE</sub> at each latitude over the five week period under clear sky conditions. (C) Difference in mean hourly UV-B<sub>BE</sub> across all latitudes under clear sky, and more overcast conditions. All irradiance data was weighted using the Caldwell plant damage action spectrum (Caldwell, 1986).**

(A)



(B)

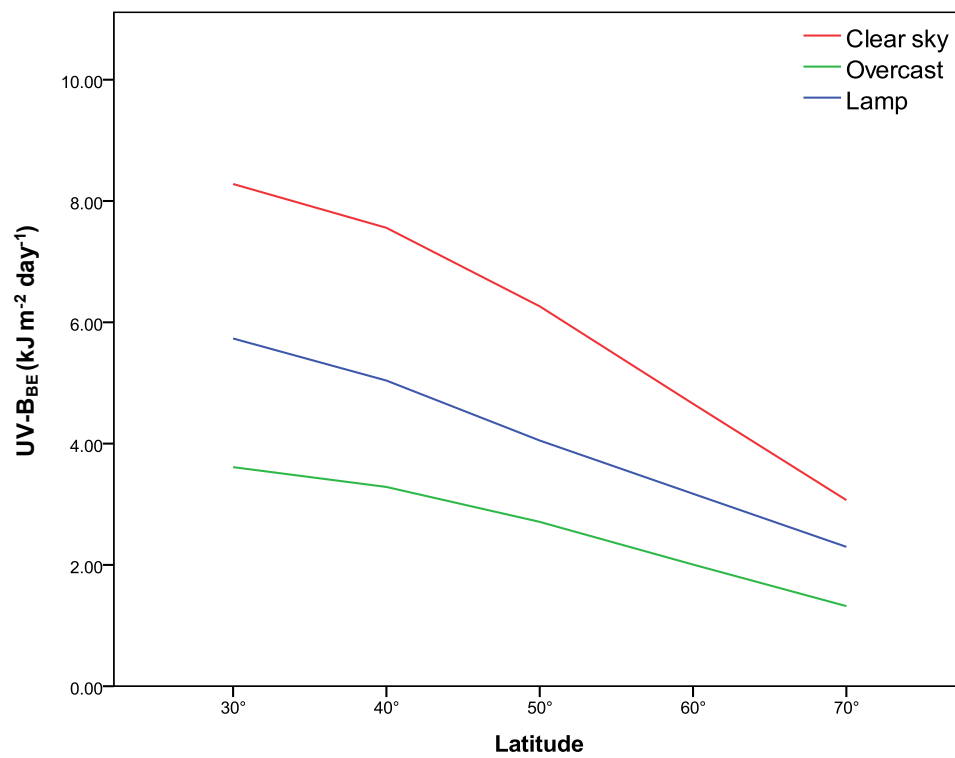


Figure S2: Measured biologically effective UV-B (UV-B<sub>BE</sub>) irradiances from the UV-B treatments under glasshouse conditions. (A) The mean UV-B<sub>BE</sub> irradiances in each treatment. (B) A projection of the simulated UV-B<sub>BE</sub> gradient in comparison to the modelled UV-B<sub>BE</sub> under clear sky and overcast conditions calculated using the ACD: TUV model. All irradiance data was weighted using the Caldwell plant damage action spectrum (Caldwell *et al.*, 1986).



**Figure S3: Representative *L. perenne* plants from each of the six UV-B treatments (including controls) demonstrating the overall aboveground and belowground responses to UV-B. UV-B treatments are shown with a decreasing biologically effective (UV-B<sub>BE</sub>) dose rate from left to right.**

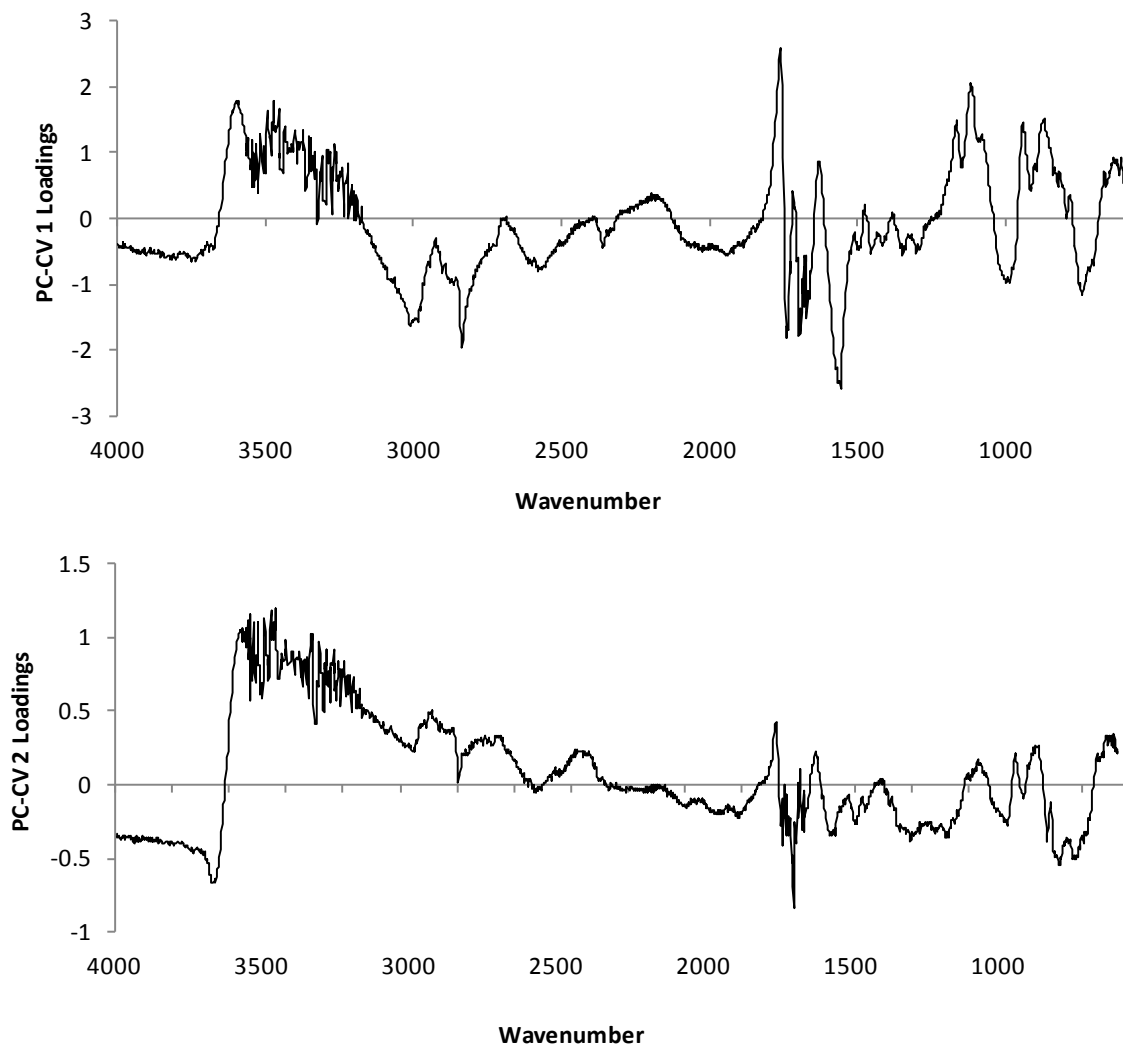


Figure S4: Wavenumber loadings on the first and second CV axes following PC-CVA analysis of FT-IR spectra of *L. perenne* leaf material raised over the simulated UV-B<sub>BE</sub> gradient.