DLI & spectra app– providing information about variation in DLI and light quality under screens and nets anywhere in the world

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The sum of solar irradiance, expressed as the daily light integral (DLI), varies across geographical locations and with time of the year. Greenhouse and tunnel covering materials developed for a range of purposes modify the spectral ratios received by plants. Knowledge of light conditions under these materials will allow growers to choose those that improve plant growth and yield through manipulation of the spectral quality of sunlight. To make information on DLI and light quality readily accessible to growers we have designed an easy-to-use app. The app provides information on: (1) solar DLI as a global map for a selected month and a monthly time series of DLI, and on (2) the effect on photon ratios of sunlight transmitted by +80 commercially available screens. DLI is calculated from the Clara 2.0 satellite surface incoming shortwave radiation data (200-4000 nm), available through EUMETSAT CM SAF Climate Monitoring. The user obtains monthly DLIs at a desired location averaged over the period of 2005-2015. The effect of the covering material is calculated at <1 nm resolution and displayed as biologically meaningful spectral photon ratios of red to far-red (R:FR), blue to green (B:G) and blue to red (B:R). For this, monthly data is estimated using a linear model based on the historical data (last 10-20 years) of total ozone column depth (NASA Aura), precipitable water vapour and aerosol optical density (NASA Aeronet AOD 2.0). Using dropdown-menus for "manufacturer" and "filter type", the user can select the best material for their desired purpose (e.g. climate screen or shade net). The app provides calculated spectral ratios of sunlight transmitted under the selected materials, and plots this information for easy visual comparison, together with an image of each material.