**README file**

Data Set Title: **“Database lettuce far-red trial”**

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**Data set Contents**

The data set consists of:

* 1 tabular file saved in .xlsx format

**Database\_lettuce\_far-red\_trial.xlsx**

* 1 README file saved in .docx format

**Database\_lettuce\_far-red\_trial\_README.docx**

**Data set Documentation**

Abstract

This dataset contains experimental data produced in the framework of the “VFARM” PRIN project. The data are related to the effect of far-red radiation on the growth of lettuce (Lactuca sativa var. Canasta) cultivated in a vertical farm system. Specifically, morphological, physiological and color data are provided. The results were presented in the publication: Carotti, L., Pistillo, A., Zauli, I., Pennisi, G., Martin, M., Gianquinto, G., & Orsini, F. (2024). Far-red radiation management for lettuce growth: Physiological and morphological features leading to energy optimization in vertical farming. Scientia Horticulturae, 334, 113264. <https://doi.org/10.1016/j.scienta.2024.113264>

Content of the file

The file **Database\_lettuce\_far-red\_trial.xlsx** contains the experimental data used in the above publication (Inventory data). The data used have been organized in Morphological Data (sheet “Morpho\_meas”), Physiological Data (sheet “Physio\_meas”), and Color Data (sheet “Colorimeter”).

List of Variables

**Type of LED light treatments**

Five different LED light treatments were tested:

* a control treatment composed by R radiation (peak at 663 nm) and B radiation (peak at 470 nm) in a ratio of 3:1 (**RB3**);
* four different treatments in which 10, 30, 50 and 70 µmol m−2 s−1 of R and B radiation were substituted by the same amount of FR radiation (FR, peak at 729 nm). **RB3-10**, **RB3-30**, **RB3-50**, **RB3-70**, respectively.

In all light treatments the ratio between R and B radiation was maintained constant at 3:1 (RB3), as also the photon flux density (set at 200 µmol m−2 s−1) and photoperiod (16 h d−1).

**Morphological Data (sheet “Morpho\_meas”)**

| **Variable** | **Description** |
| --- | --- |
| **Day** | Measurements performed at 8, 15, 22, or 29 days of cultivation (Day After Transplanting, DAT) |
| **Trattamento** | Type of LED light treatment: RB3-, RB3-10, RB3-30, RB3-50, RB3-70 |
| **Replicate** | 3 |
| **Plant per replicate** | 5 |
| **Plant height (cm) pianta** | Height of the plant in cm |
| **Leaf Fresh Weight (g plant-1)** | Fresh biomass of plant leaves in gram per plant |
| **Stem Fresh weight (g plant-1)** | Fresh biomass of plant stem in gram per plant |
| **Leaf number** | Number of leaf per each plant |
| **Leaf area (cm2 plant-1)** | Surface of plant leaf in cm2 per plant |
| **Leaf lenght (cm)** | Maximum lenght of the leaf in cm |
| **Leaf width (cm)** | Maximum width of the leaf in cm |
| **Leaf dry weight (g plant-1)** | Dry biomass of plant leaves in gram per plant |

**Physiological Data (sheet “Physio\_meas”)**

| **Variable** | **Description** |
| --- | --- |
| **Day** | Measurements performed at 8, 15, 22, or 29 days of cultivation (Day After Transplanting, DAT) |
| **Trattamento** | Type of LED light treatment: RB3-, RB3-10, RB3-30, RB3-50, RB3-70 |
| **Replicate** | 3 |
| **Plant** | 5 |
| **Leaf Temp** | Average temperature of leaf of the plant in °C |
| **Stomatal conductance** | Estimate of the rate of gas exchange (i.e., carbon dioxide uptake) and transpiration (i.e., water loss as water vapor) through the leaf stomata as determined by the degree of stomatal aperture in mmol per m2 per second |
| **SPAD** | Relative chlorophyll content measured by a SPAD expressed in SPAD unit |

**Color Data (sheet “Colorimeter”)**

| **Variable** | **Description** |
| --- | --- |
| **Caratteristiche Gruppo** | Type of LED light treatment: RB3, RB3-10, RB3-30, RB3-50, RB3-70 |
| **L\*(C)** | The lightness value L\* defines black at 0 and white at 100. |
| **a\*(C)** | The a\* is relative to the green–red opponent colors, with negative values toward green and positive values toward red. |
| **b\*(C)** | The b\* represents the blue–yellow opponents, with negative numbers toward blue and positive toward yellow. |