**README file**

Dataset title: “**Research data for enhancing water use efficiency (WUE) and yield in Lactuca sativa: a comparative study of simplified soilless cultivation (SSC) versus traditional soil-based systems in Colombia**”

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**Dataset Contents**

The data set consists of:

• 1 quantitative data file saved in csv format

**" Morettietal\_AAHC24\_Dataset.csv"**

• 1 README file saved in .rtf format

**“ Morettietal\_AAHC\_ReadMe.rtf"**

**Data set Documentation**

Abstract

This dataset explains a study conducted in Popayán, a city in Cauca region of southern Colombia, aiming a evaluate the effectiveness of a simplified soilless system for growing lettuce (Lactuca sativa L.) compared to traditional soil-based cultivation. The soilless system "Garrafas PET," was built using locally available materials such as bamboo poles and recycled plastic bottles, making it an accessible and cost-effective solution. Different types of growing substrates were tested, including coconut fiber, peat, carbonized rice husk, and a combination of all three (1:1:1).

Content of the file

File **Morettietal\_AAHC24\_Dataset.xslx** contains one sheet where the agronomic variables are reported, indicating the substrate treatment in the first column, the replicate in the second, and the measured variables from the third column.

File specifics

The file is in .csv format and can be used on several software (excel, R, Python, Matlab). The .csv file has the following specifics:

* Character set UTF-8
* Field delimiter « ; » (semicolon)

Notes

The data are presented in the following publication:

Moretti, G., F., Michelon, Cerasola, V.A., C., Pennisi, Cepeda M.L, Solarte M.G., Orsini, M., Gianquinto, G., 2025. Enhancing water use efficiency (WUE) and yield in Lactuca sativa: a comparative study of simplified soilless cultivation (SSC) versus traditional soil-based systems in Colombia. Acta horticolturae.

Methodologies

The experiment was realized between October and December 2024 (Popayan, Colombia) in the simplified hydroponic system and traditional cultivation system described in the abstract. An experiment of three-block experimental design three-times replicated was implemented, where 4 growing substrates were tested in combination with the plant position in the bottle line and compared with a soil-based trial on the same variety. The system design is composed by 20 lines of plastic bottles, each featuring 10 bottles (and each hosting 2 plants, for a total of 20 plants per line). Blocks were represented by the bottle lines, while replicates were represented by three plants harvested at 35 days after transplanting (DAT).

The first and the last plant were not included in the data monitoring to mitigate the border effect.

List of variables

|  |  |
| --- | --- |
| **Parameter** | **Description** |
| **treatment** | Treatments with **soil** and growing media, including coconut coir **(coconut),** carbonized rice hulls (**rice hulls**), **peat** and a mix of the three substrates **(mixed).**   |
| **replicate** | Three replicates for each analyzed sample, named “1”, “2”, “3” |
| **Leaves\_num** | Total number of leaves counted in the sampled plant at the harvest |
| **Marketable\_fresh\_weight** | Weight of the plants classified as marketable at the harvest (grams per m-2) |
| **Leaf\_area** | Total leaves area of plants (cm -2) |
| **SPAD** | SPAD value monitored with the SPAD (Konica Minolta). Adimensional |
| **WUE** | Water Use Efficiency (WUE) calculated as the grams of fresh marketable weight per Liter of water used. |