Data for: Strip-cropping legacy enhances potato plant defence responses to aphids via soil-mediated mechanisms

SND-ID: 2024-478. **Version**: 1. **DOI**: https://doi.org/10.5878/kr3s-6v85

Download data

Experimental_data.tsv *(9.47 KB)*

Metabolome_data_Samples.tsv *(2.79 KB)*

Metabolome_data.tsv *(1.22 MB)*

Metabolome_KNAPSACK_matches_M-H.tsv *(1.41 MB)*

Metabolome_Putative_annotations.tsv *(232.63 KB)*

Associated documentation

Readme.txt *(5.29 KB)*

Download all files

2024-478-1.zip *(~2.87 MB)*

Citation

Riggi, L. G., Kloth, K., Mumm, R., & de Vos, R. (2024) Data for: Strip-cropping legacy enhances potato plant defence responses to aphids via soil-mediated mechanisms (Version 1) [Data set]. Swedish University of Agricultural Sciences. Available at: https://doi.org/10.5878/kr3s-6v85

Creator/Principal investigator(s)

Laura G.A. Riggi - Swedish University of Agricultural Sciences, Department of Ecology

Karen Kloth - Wageningen University & Research, Entomology

Roland Mumm - Wageningen University & Research, BIOS Applied Metabolic Systems

Ric de Vos - Wageningen University & Research, BIOS Applied Metabolic Systems

Research principal

Swedish University of Agricultural Sciences - Department of Ecology

Description

The data presents results from a complete randomized block design greenhouse factorial pot experiment with eight treatments and ten replicates per treatment (n = 80) with one potato plant (S. tuberosum, ‘Fontane’) per 5 L pot, at Wageningen University, Netherlands, between February and April 2022. The experiment consisted of three factors, ‘Strip-cropping legacy’ (with two levels), ‘AMF inoculation’ (with two levels) and ‘Herbivore’ (with two levels). The greenhouse was organized in ten spatial blocks and each of the eight treatments was present in each block.
In each pot we measured Aphid population growth, AMF root colonization, potato biomass, potato tuber yield, N & P in leaves, and potato plant metabolites using LC-MS untargeted methods.

Data contains personal data

No

Language

English

Unit of analysis

Individual

Population

Investigation was done on individual potted potato plants.
The data presents results from a complete randomized block design greenhouse factorial pot experiment with eight treatments and ten replicates per treatment (n = 80) with one potato plant (S. tuberosum, 'Fontane').
In each potted potato we measured Aphid population growth, AMF root colonization, potato biomass, potato tuber yield, N & P in leaves, and potato plant metabolites (using LC-MS untargeted methods).

Study design

Experimental study

Description of study design

We used a green-house experiment with potato plants to explore the soil legacy effects of mono-cropping versus strip-cropping systems, AMF inoculation and aphid infestation on AMF root colonization, the induction of plant defences (untargeted LCMS-based metabolomics), aphid population size and potato yield.

Sampling procedure

Individual potato were left to grow for 10 weeks and then each potato was , sampled for yield (tuber weight and numbers), biomass (dry weight), aphid count, AMF root colonization % (using the staining method). Metabolites in the leaves were assessed using LC-MS analyses and then annotated manually and using available datasets in KNAPSACK.

Time period(s) investigated

2022-02-01 – 2022-04-30

Data format / data structure

Numeric

Text

Species and taxons

Solanum tuberosum

Data collection 1

- Mode of collection: Experiment
- Description of the mode of collection: We conducted a complete randomized block design greenhouse factorial pot experiment with eight treatments and ten replicates per treatment (n = 80) with one potato plant (S. tuberosum, 'Fontane') per 5 L pot, at Wageningen University, Netherlands, between February and April 2022. The experiment consisted of three factors, 'Strip-cropping legacy' (with two levels), 'AMF inoculation' (with two levels) and 'Herbivore' (with two levels). The greenhouse was organized in ten spatial blocks and each of the eight treatments was

present in each block.
- Time period(s) for data collection: 2022-02 – 2022-04
- Data collector: Swedish University of Agricultural Sciences
- Source of the data: Biological samples

Geographic spread

Geographic location: Netherlands

Geographic description: For the strip-cropping legacy treatments, plants were grown either in soil from the middle of 100 m2 mono-cropped plots (mono) or from the edge of strip-cropped plots (strip), collected from the long-term organic strip-cropping experiment at Wageningen University (51°59’33.06” N, 5°39’43.56” E)

Responsible department/unit

Department of Ecology

Contributor(s)

Wageningen University & Research

Funding 1

- Funding agency: FORMAS
- Funding agency's reference number: 2020-02281

Funding 2

- Funding agency: Centre for Biological Control

Research area

Ecology (Standard för svensk indelning av forskningsämnen 2011)

Farming (INSPIRE topic categories)

Biota (INSPIRE topic categories)

Keywords

Soil, Inoculation, Biological pest control, Solanum tuberosum, Jasmonic acid, Arbuscular mycorrhiza, Metabolomics

Publications

Riggi L.G.A Dirham, A., Akangbe, O., de Vos, R., Fijen, T., van Apeldoorn D., Mommer L., van Arkel, J., Mumm R., Emery, S.E., Kloth K.J. Strip-cropping legacy enhances potato plant defence responses to aphids via soil-mediated mechanisms. Functional Ecology [Accepted]
DOI: https://doi.org/10.1111/1365-2435.14670

Accessibility level

Access to data through SND
Data are freely accessible

Use of data

Things to consider when using data shared through SND

License

CC0 1.0

Versions

Version 1. 2024-09-24

Contacts for questions about the data

Laura Riggi
laura.riggi@slu.se
SLU Arkiv
arkiv@slu.se

Download metadata

DataCite
DDI 2.5
DDI 3.3
DCAT-AP-SE 2.0
JSON-LD
PDF
Citation (CSL)
File overview (CSV)

Published: 2024-09-24
Last updated: 2024-09-25