

DataPLANT & FAIRagro – Connecting plant and agricultural sciences via common RDM frameworks

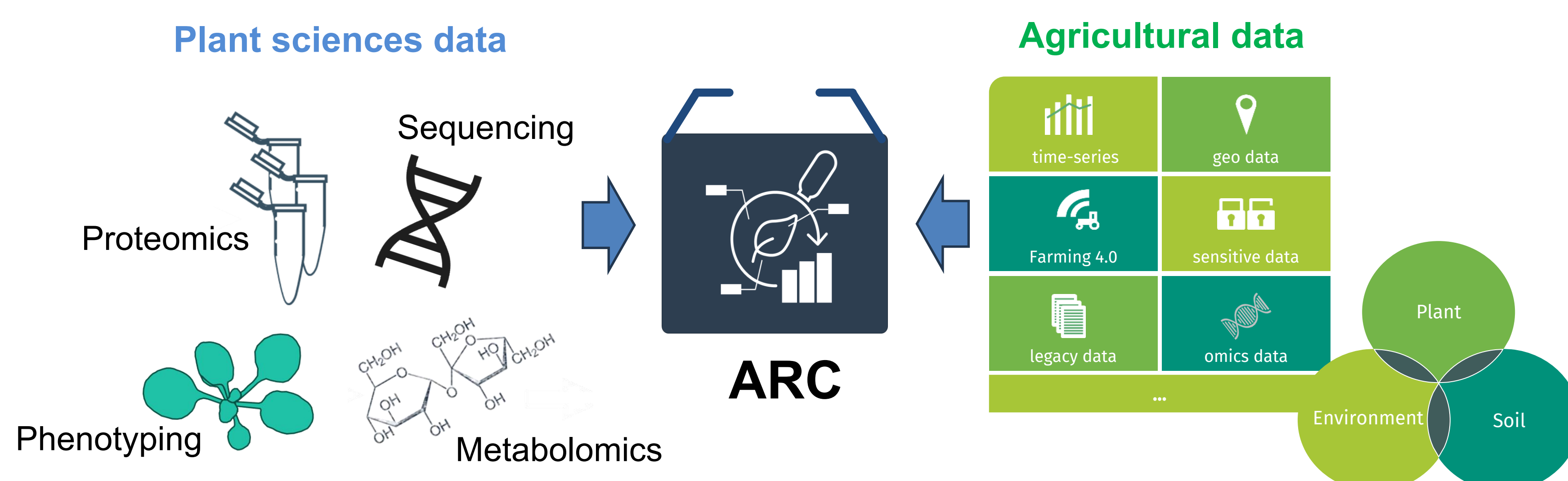
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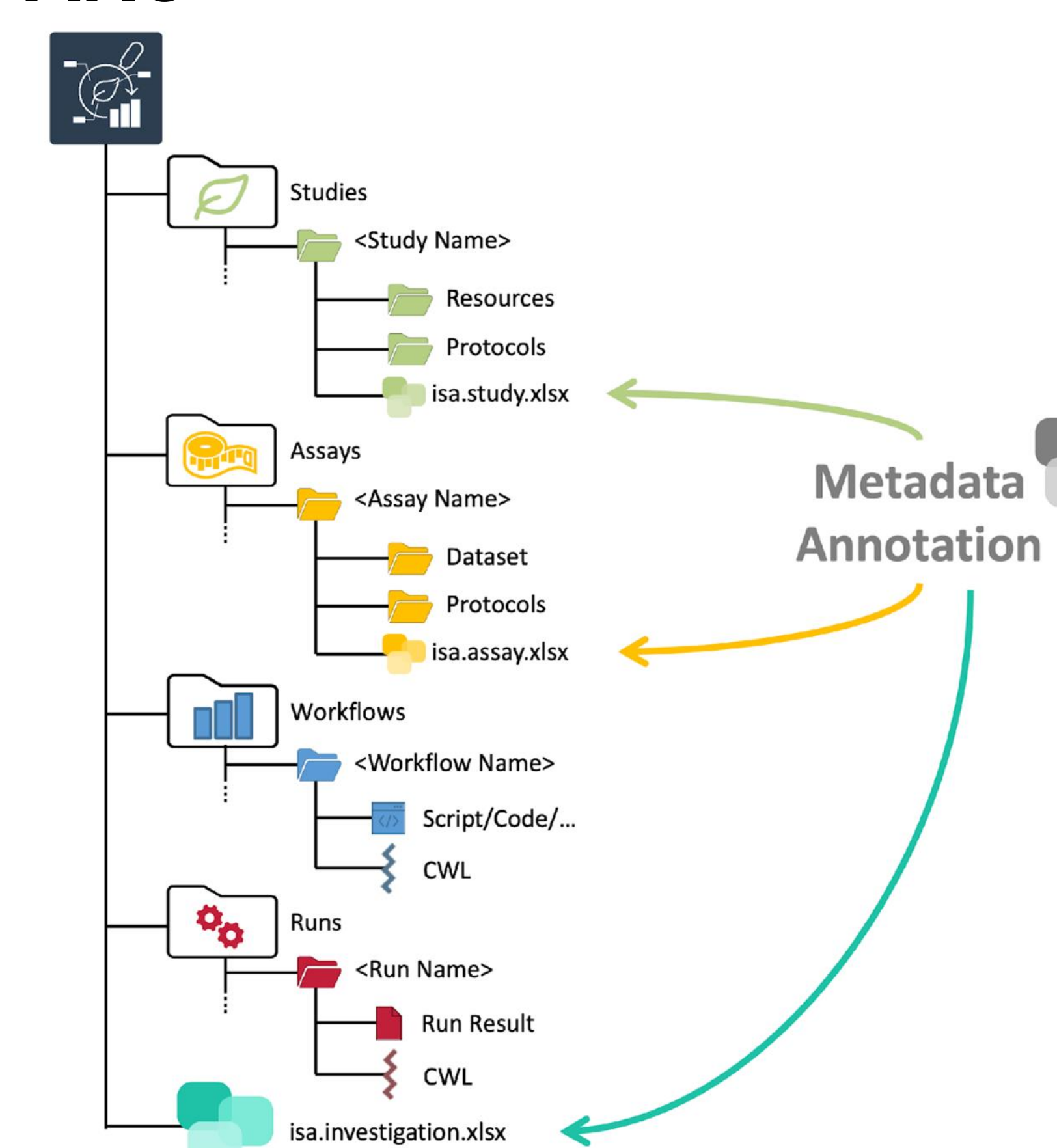
Summary

How can we connect research data from different research domains, scales and types? Using research data management (RDM) frameworks developed by DataPLANT, we demonstrate the harmonization of research data for plant and agricultural science based on actual use cases from FAIRagro. The annotated research context (ARC) serves as the central concept for data and metadata packaging [1].



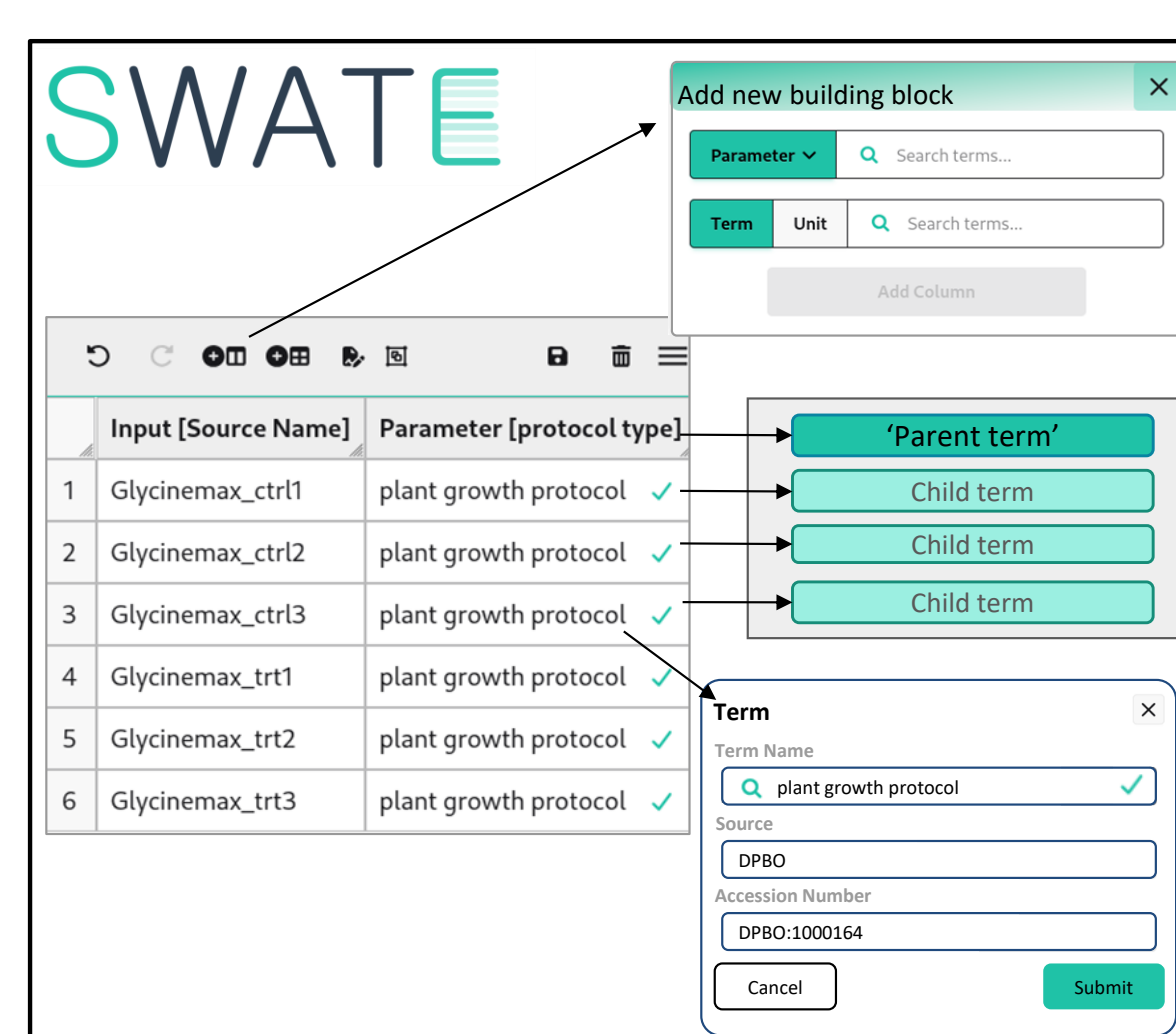
RDM frameworks: FAIR digital objects and metadata templates

ARC

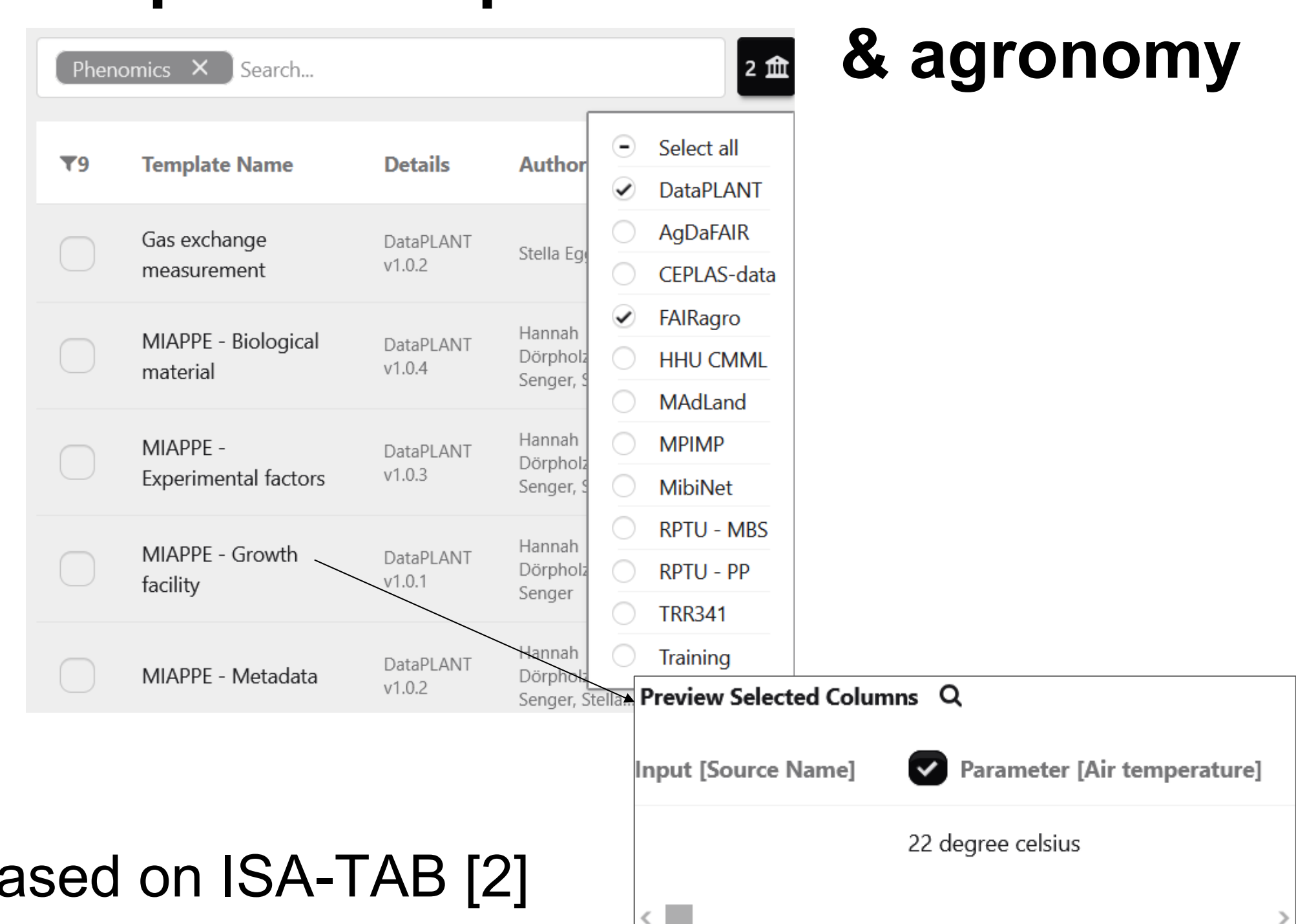


Data and metadata are stored in a FAIR digital object that is based on the ISA (investigation, study, assay) standard [2]

Metadata annotation tool



Templates for plant sciences & agronomy



- Swate [3] allows metadata annotation based on ISA-TAB [2]
- Extensive ontology collection [4] accessible within the tool
- Ready-to-fill templates [5] for minimum information metadata standards (e.g. MIAPPE), data repository checklists and commonly used protocols with a focus on plant sciences and agronomic data
- Community templates can be contributed by any user
- Templates can be flexibly modified or combined

Use case: FAIRagro ARC

Sustainable crop production requires knowledge on the structural and functional status of the crops in the field to plan and execute precise field interventions. To quantify complex plant traits such as stress resilience or disease resistance, the combination of noninvasive phenotyping with sensors, advanced data analytics methods and machine-learning algorithms are nowadays state of the art.

Aims:

- Development of structured metadata formats to enable heterogeneous cross-discipline data to move towards FAIR data.
- Consolidated benchmark dataset across spatial, temporal, and thematic dimensions as a foundational resource for the research community.

⇒ Benchmark dataset and metadata are packaged in the ARC format

Benchmark Dataset for Field Phenotyping

Version 3.1

Grygosch, Lars; Kleppert, Ireneusz; Rascher, Uwe, 2024, "Benchmark Dataset for Field Phenotyping", <https://doi.org/10.26165/JUELICH-DATA/3F60FJ>, Jülich DATA, V3

[Cite Dataset](#)

[Learn about Data Citation Standards.](#)

Description

A collection of Datasets as Benchmark for FAIRagro community

Subject

Agricultural Sciences; Computer and Information Science

Keyword

Data Management, FAIR, Plant Phenotyping

Notes

This work was created as part of the NFDI consortium FAIRagro (www.fairagro.net). We gratefully acknowledge the financial support of the German Research Foundation (DFG) –project number 501899475.

Institute

IBG-2

Storage Location URL

<https://doi.org/10.26165/JUELICH-DATA/2BYDTH>; <https://doi.org/10.26165/JUELICH-DATA/QKJKPW>; <https://doi.org/10.26165/JUELICH-DATA/XWRNHR>; <https://doi.org/10.26165/JUELICH-DATA/QJIY7C>

Dataset Metrics

21 Downloads

Acknowledgements and resources

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- [1] Weil et al. (2023), The Plant Journal 116 (4), 974-988. DOI: 10.1111/tpj.16474
 [2] Sansone et al. (2008), OMICS A Journal of Integrative Biology 12.2, 143-149.DOI: 10.1089/omi.2008.0019
 [3] <https://github.com/nfdi4plants/Swate>
 [4] https://github.com/nfdi4plants/nfdi4plants_ontology
 [5] <https://github.com/nfdi4plants/swate-template-registry>

The whole DataPLANT consortium has contributed to the development of the mentioned tools, RDM concepts and illustrations.