# White Paper for the enactment phase of the Agricultural Research Federation (AgReFed)

Version 1.2

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## Important disclaimer

## Acknowledgements

# Version history

| Date | Version | Description |
|---|---|---|
| 12 August 2019 | 1 | Drafted by Box, P., Epstein, J., Wong, M., Thompson, H., Lee, A., Levett, K.<br>Release for review to potential founding partners. |
| 21 August 2019 | | Reviewed and endorsed with updates by potential founding partners through representatives: R.Hergenhan, P.Dalhaus, P.Wilson, H.Millar, R.David |
| 29 August 2019 | 1.1 | Updates made. Endorsed by Council |
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# Document purpose

This document provides a high-level overview of enactment of the Agricultural Research Federation (AgReFed). It proposes a Vision and Mission for AgReFed, together with some design principles that will underpin AgReFed through this initiation phase.

The document is intended to inform, and be used for discussion with AgReFed founding partners, to confirm the intended purpose and direction of AgReFed, and inform the enactment process; that is, the process of bringing AgReFed into being.

The content of this White Paper provides the recommended starting point at AgReFed enactment for founding partners to set about achieving a collective vision. It is proposed that going forward it will be the members that take ownership and shape AgReFed policies and processes through co-operative governance.

# Background

The emergent agricultural data ecosystem in Australia is ad hoc and unstructured, resulting in much of the potential value of agricultural data not being fully realised[1]. The legal and regulatory frameworks around agricultural data are piecemeal and producers have low trust in technology and service providers around the access and use of agricultural data[1]. Agricultural research data are currently siloed within multiple organisations, including universities, government, statutory organisations (e.g. CSIRO, GRDC) as well as in the private sector (e.g. farming groups, advisory services). Access to these data is limited with often significant costs involved in both finding and obtaining access to trusted data for a specific purpose; these costs are replicated for other users of the same data, making the process of data sharing highly localised and inefficient[2]. Furthermore, when trusted data are at last found and accessed, the data is not understandable or analysis-ready in standard formats that allow reuse and integration with other datasets or data types[3].

Scientific communities are increasingly aligning around common data guidelines to enable FAIR sharing of data, that is, that data is made more findable, accessible, interoperable and re-usable [4]. Australian research policy and agricultural sector recommendations highlight that for research in the agricultural sector to more efficiently contribute to improving competitiveness and innovation in Australian agriculture, data from across the various organisations and subject domains need to be made FAIR within an environment that ensures the trust of data providers and users[5,6].

The Agricultural Research Federation (AgReFed) was funded by ARDC to help close the gap of FAIR data in agriculture through an initial project that has now been completed. This project achieved the delivery of initial exemplar FAIR agricultural data, the establishment of core technical infrastructure and the development of a proposed governance and data stewardship framework. The [AgReFed governance and stewardship model][7] is a networked governance model enabling a federated community of distributed data providers to work together for sustained provision of FAIR agricultural research data.

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[1] Wiseman, L., & Sanderson, J. (2017)

[2] Box et al. (2015)

[3] Barry, S. *et al.* (2017)

[4] Stall, S., et al. (2018)

[5] National Health and Medical Research Council (2018)

[6] Darnell, R., *et al.* (2018)

[7] Box *et al.* (2019)

The enactment phase is the work required to bring AgReFed into existence, to build the community of agricultural research data providers and users, and to implement and test the governance and stewardship model by which this community will act.

# AgReFed establishment

## Proposed Vision

Enabling FAIR AGricultural data to accelerate innovation and increase profitability and sustainability of Australian agriculture.

## Proposed Mission

**Enactment phase**

Establish AgReFed and grow the collection of agricultural data from the agricultural research community.

**Longer term**

To unlock the potential of agricultural data from research organisations, government, ag producers and other agricultural industry players by providing a data sharing platform which will enable Australian researchers, industry and government to share and use FAIR data to increase the application of knowledge, accelerate innovation and improve decision making.

AgReFed will pursue this mission by

(a) Bringing together and aligning independent organisations to make strategic and technical decisions about data sharing;

(b) Providing a governance and data stewardship framework for collective decision making;

(c) Providing the infrastructure, tools and resources for research organisations to develop the capacity to make their Agricultural research data FAIR;

(d) Enabling increasingly FAIR data from individual research organisations available for use by the broader agricultural research community; and

(e) Incorporating and enabling access to complementary data important to agricultural research.

In the longer term, it is proposed that AgReFed transition from a research data cloud to a platform, where agricultural data users access / co-create shared tools, workbenches, data pipelines and analysis tools.

## Immediate steps – enactment

It is proposed that in the Enactment Phase, AgReFed will:

- Identify AgReFed members and establish governance mechanisms (Federation Council and Technical Committee) through which AgReFed will be steered and governed;
- Establish the key roles for AgReFed; and
- Develop proposed strategy and operation model for AgReFed.

The governance and stewardship arrangements developed through these activities, together with the enabling technical infrastructure (developed through the first phase of the project) will enable the community to work towards making more agricultural data more FAIR for use across the broader agricultural sector, at a reduced transaction cost for both providers and users.

## AgReFed organisational form

AgReFed will be organised according to cooperative principles[8]. This approach is thought appropriate as cooperatives are created and operated for the members to meet agreed shared objectives with equitable distribution of benefits amongst members.

The seven principles for cooperatives are:

- Voluntary and open membership
- Democratic member control
- Member economic participation
- Autonomy and independence
- Education, training, and information
- Cooperation among cooperatives
- Concern for Community

In the initial establishment phase of AgReFed it is not envisioned that a new organisation cooperative or corporation will be formed to operate AgReFed. Rather than establishing a separate legal entity, one organisation, Federation University Australia (FedUni) will act as the host.

As AgReFed host, FedUni will be responsible for maintaining AgReFed technical infrastructure and will act as secretariat and fund holder.

FedUni will undertake some key AgReFed roles aligned with accelerating sector capacity for FAIR data.

# Governance

For large scale collaborative initiatives comprising multiple stakeholders across many organisations working toward a common vision, the design of governance is critical. This is the case for AgReFed, particularly as it aims to improve and align data sharing across multiple organisations with their own internal regulations and processes.

Data governance, i.e. roles and processes for making decisions about and controlling data, is recognised as being one of the most critical issues across the agricultural sector[9].

The data governance mechanism in AgReFed will be the Federation Council which will set and administer the rules and standards to enable data sharing and reuse. At present AgReFed is conceptualised as individual data providers offering the data that they own and control under open license terms (e.g. Creative Commons Attribution (CC-BY)) to users via a data sharing platform. All data are owned by the providers, who determine with whom they will share the data, and under what conditions, within the rules set by AgReFed to ensure that data delivered through AgReFed is both FAIR and trusted. If in the future the need emerges to collectively govern datasets combined through the AgReFed platform, data governance arrangements will need to be extended.

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[8] https://www.ica.coop/en/cooperatives/cooperative-identity

[9] Wiseman, L., & Sanderson, J. (2017)

## Policy Recommendations

The *Guidelines for the development of a Data Stewardship and Governance Framework for AgReFed* (*Guidelines* document) identifies a set of Steering[10] and Rowing[11] policies which need to be developed for the enactment of AgReFed.

A brief description of the proposed approach for each policy is provided below.

### AgReFed Establishment Policy

The proposed organisational form, vision and mission for AgReFed, and the development of a strategic plan are elements of the establishment policy set, and are discussed elsewhere in this White Paper.

Federation University Australia will act as secretariat and provide maintenance of the technical infrastructure to continue to make founding members' data and services available through the establishment phase.

### Membership Policy

It is proposed that initially, membership of AgReFed is open to any publicly funded research organisation that undertakes agricultural research.

In order for Data Provider communities to be represented in decision-making, each Data Provider community is to nominate one representative for the Federation Council and one representative for the Federation Technical Committee (see AgReFed role assignments below).

Each Data Provider community is to nominate a Provider Collection Custodian. A Provider Collection Custodian may be responsible for more than one collection, and a collection must have at least one custodian (see AgReFed role assignments policy below).

The exit and entry protocols for AgReFed membership will be outlined in this policy.

The responsibilities of members (e.g. making their data FAIR, preparedness to answer questions about their data) will be outlined in the AgReFed role assignment policies.

### AgReFed Role Assignment Policies

Federation Council: (see *Guidelines* document p.17)
- Made up of one representative from each Data Provider community;
- Responsible for the strategic direction and oversight of operations of AgReFed; and
- It is proposed the Federation Council meets quarterly; time commitment ~2 hrs per month post establishment.

Federation Technical Committee: (see *Guidelines* document p.17)
- Made up of one representative from each Data Provider community;

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[10] Steering means establishing, maintaining (and terminating) AgReFed and encompasses governance, coordination, management and funding of AgReFed to enable it to achieve its objectives (see *Guidelines* p. 16)
[11] Rowing means achieving the community objectives – includes making operational the policies, roles, responsibilities and processes to ensure AgReFed enables FAIR agricultural data to be discovered, accessed and used (see *Guidelines* p. 16)

- Makes (technical) decisions about technical domains e.g. the acceptable levels for AgReFed FAIR and Trusted data, agreed semantics; authorises the publication of data via AgReFed; and
- It is proposed the Technical Committee meets monthly; time commitment ~4 hrs per month post Establishment.

<u>Provider Collection Custodian:</u> (see *Guidelines* document p.18)

- A Provider Community representative is nominated to represent the interests of the collection in AgReFed;
- The representative has responsibility for ensuring the collection's sustained FAIRness according to agreed policies, including ensuring the creation, management and discoverability of metadata and vocabularies consistent with AgReFed policies and
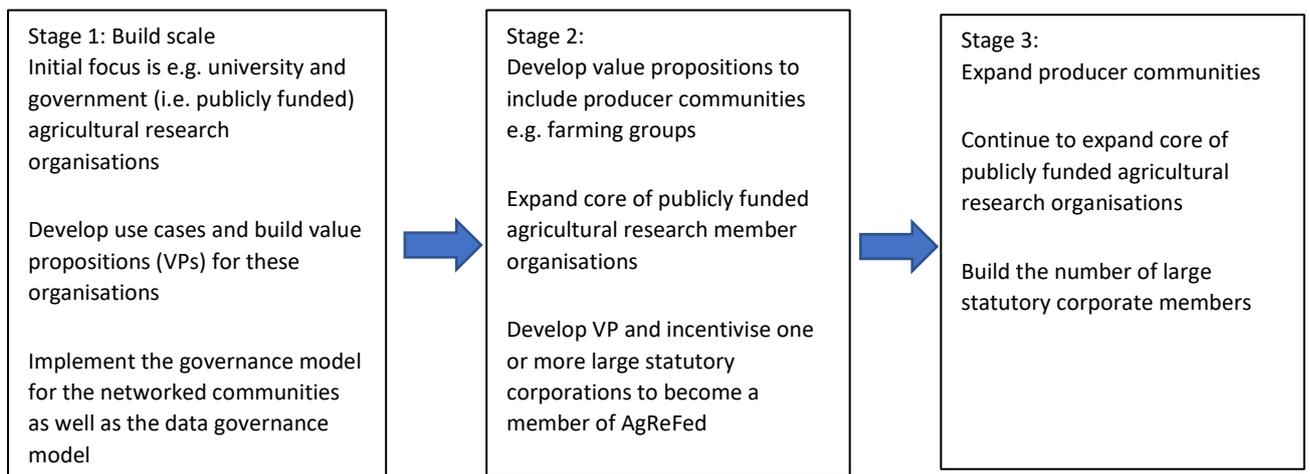- The representative liaises with the repository manager to ensure sustained access to the collection.

Terms of Reference (ToR) and Role Responsibilities will be proposed for the Federation Council and for the Technical Committee.

Additional proposed AgReFed roles for consideration by the Council include a Federation Data Steward and a Federation Standards and Vocabularies Steward (optional role, as needed if expertise is required beyond that of the Technical Committee) – as described in the *Guidelines* document p.18.

## Strategic and Business Policies

It is recommended that the strategic direction of AgReFed be developed by the Federation Council, documented and communicated to Members via a rolling 3-5 year Strategic Plan.

The following provides a high level outline of the proposal strategy for AgReFed - as a staged development - for consideration and discussion by the Federation Council.

| Stage 1: Build scale | Stage 2: | Stage 3: |
|---|---|---|
| Initial focus is e.g. university and government (i.e. publicly funded) agricultural research organisations | Develop value propositions to include producer communities e.g. farming groups | Expand producer communities |
| Develop use cases and build value propositions (VPs) for these organisations | Expand core of publicly funded agricultural research member organisations | Continue to expand core of publicly funded agricultural research organisations |
| Implement the governance model for the networked communities as well as the data governance model | Develop VP and incentivise one or more large statutory corporations to become a member of AgReFed | Build the number of large statutory corporate members |

It is recommended that the AgReFed Strategic Plan includes the following:

- Background
- Vision and Mission
- Objectives for the next 3-5 years, including desired output, outcome and impact
- Value propositions chosen and how they will be delivered (i.e. *provided* and *communicated*)

- Resources and capabilities required, plans to close any capability gaps
- Risk management plan
- Financials (revenue, costs and cash flow, including sources of external funding required)

It is proposed that the Strategic plan should be reviewed every six months.

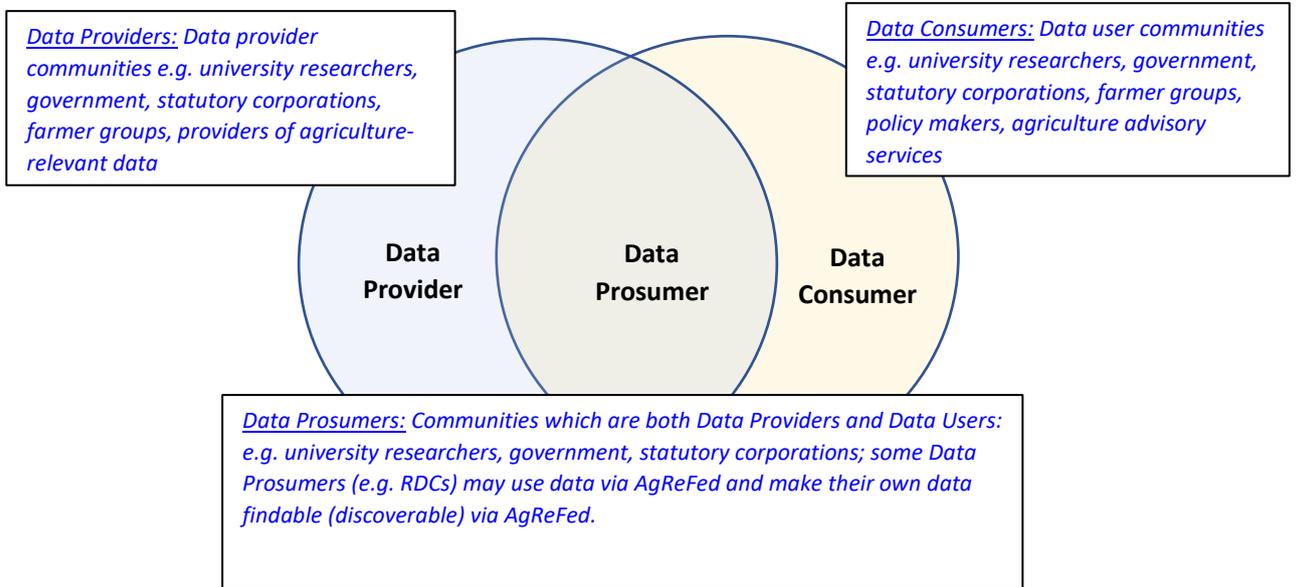Proposed key elements of the value propositions for Data Provider, Data Consumer and Data Prosumer participants in the AgReFed community are outlined in the schematic below.
It is noted that Stage 1 is focused on the Data Providers and Data Prosumers and meeting their needs. Prosumers are an important stakeholder as they are data providers who wish to use AgReFed to service their own user needs.

# Schematic of example value propositions to prospective AgReFed communities:

("Data" means FAIR agricultural research data and FAIR agriculture-relevant data)

*Data Providers: Data provider communities e.g. university researchers, government, statutory corporations, farmer groups, providers of agriculture-relevant data*

*Data Consumers: Data user communities e.g. university researchers, government, statutory corporations, farmer groups, policy makers, agriculture advisory services*

**Data Provider**

**Data Prosumer**

**Data Consumer**

*Data Prosumers: Communities which are both Data Providers and Data Users: e.g. university researchers, government, statutory corporations; some Data Prosumers (e.g. RDCs) may use data via AgReFed and make their own data findable (discoverable) via AgReFed.*

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*Value Proposition - Data Provider*

Key Benefits vs alternatives
More effectively build FAIR skills, capabilities
(learn by doing)
Lower cost to provide FAIR data
Data is more discoverable, citable and usable by others (with negotiated licensing)
Data is potentially made more valuable by combining with other data
Better able to meet requirements of Australian Code for the Responsible Conduct of Research

Trade-off
Investment of time and resources required to render their own data FAIR

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*Value Proposition - Data Consumer*

Key Benefits vs alternatives
Greater opportunity for new insights, discovery
Reduced costs of research; lower costs to discover and use data (e.g. data is interoperable, data exchange standards)
Greater access to data
Research data in general is more discoverable

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*Value Proposition - Data Prosumer*

The value proposition for the Data Prosumer is a combination of the value propositions for the Data Provider and Data Consumer

## Funding and Finance Policies

It is proposed that financial decision making will be shared; that the Federation Council has responsibility for securing funding, and that the Federation Council will be responsible for consulting Data Provider members over the distribution of funds and making decisions in the best interests of Data Provider members.

## AgReFed FAIR Data and Trusted Data Policies

(See *Guidelines* document p. 38-39).

Further consideration is required to develop the AgReFed FAIR and Trusted Data policies from the initial set of thresholds - to be discussed at the inaugural meeting of the Federation Technical Committee (including achieving the more challenging components of FAIR e.g. interoperability, particularly semantic interoperability).

There are a number of organisations and working groups (both nationally and internationally) developing data exchange standards, vocabularies, infrastructure and tooling for FAIR data applicable to the agricultural domain. It is recommended that AgReFed is aware of and establishes linkages with these.

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