Agricultural data rules:
Enabling Best Practice

Authors:
Associate Professor Leanne Wiseman - Griffith University
Professor Jay Sanderson - USC

RDC PARTNERS

RESEARCH PARTNERS

About the authors

Leanne Wiseman is an Associate Professor in Law at the Griffith Law School, Griffith University and Associate Director of the Australian Centre for Intellectual Property in Agriculture (www.acipa.edu.au). Leanne researches and publishes in the areas of intellectual property, corporate and contract law. Leanne's current research focuses on the intersection between law, technology and agriculture, with particular focus on the legal issues arising from the adoption and uptake of digital agricultural technologies.

Contact: l.wiseman@griffith.edu.au

Jay Sanderson is Professor in Law at USC Australia and a member of the Australian Centre for Intellectual Property in Agriculture. He is also an Adjunct Research Fellow with the Law Futures Centre (Griffith Law School, Griffith University). Jay researches and publishes in the areas of intellectual property, food and agriculture; his current research focuses on trade marks, certification and BioTrade.

Contact: jsander4@usc.edu.au

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1 Overview

This project ('Data Rules') grew out of the 'Accelerating precision agriculture to decision agriculture: Enabling digital agriculture in Australia' (P2D) project, which evaluated the current and desired state of digital agriculture in Australia. There were 13 key recommendations made, one of which highlighted the need for agricultural data governance to be developed. This Data Rules component of the broader 'Growing a Digital Future for Australian Agriculture' research project represents a response to the P2D recommendations around establishing data rules (i.e. governance). Specifically, this project used desktop analysis and consultation with key stakeholders to identify issues around the collection, management and sharing of agricultural data. The aim of which was to develop a data rules framework and action plan – a framework and action plan that will create an enabling environment for digital innovation in Australian agricultural industries.

Agricultural data must be managed like any other asset. This requires strategy and best management practice. Importantly there needs to be a clear direction and sense of what needs to be achieved through the collection, use and sharing of agricultural data. The aim of an Agricultural Data Strategy, which is yet to be developed at a National level, is to guide the creation of an enabling environment where Australian agricultural industries are able to produce and share high quality data outputs. This is important because the adoption of digital technology plays an important role in achieving the $100 billion in farm gate output by 2030 as set out by the National Farmers' Federation (NFF). Importantly, too, an Agricultural Data Strategy will bring more than just economic benefits to the sector, as ACCC Commissioner, Mick Keogh observed, on 16 September 2019 in his speech to the National Forum on *Growing a Digital Future for Australian Agriculture* ('A national vision for digital agriculture') a digital and data strategy will also bring improved environmental outcomes including land management and water use. The benefits will also extend beyond the farm, with some of the biggest gains in value likely to be generated along the supply chain, from the farm to consumer.

In addition to a National Data Strategy, creating an enabling environment to facilitate agricultural innovations will help manage data as an asset and ensure best practice for Agricultural Data. This is the focus of this Report and, establishing agricultural data rules is a crucial first step in ensuring the whole of the **Australian Agricultural Industry** develops best practice in the collection, use and sharing of agricultural data while ensuring farmers' legal, ethical and security concerns are addressed.

The key pillars and components of **Agricultural Data Rules: Enabling Best Practice** are presented in Figure 1.

1.1 The Role of Peak Agricultural Industry Bodies

It is important to note the aim and purpose of this Report is to provide a guide to best data management practice to farmers and the agri-businesses and associations who collect, manage and share their data. It is noted that Government, their Departments and some Rural Research and Development Corporations (RDCs) are regulated by many existing legal obligations and data management principles and practices and thus already adhere to many of the best management practice principles outlined here.

The RDC community plays an important role in encouraging, developing and advocating best practice in the use of digital technology and data within agricultural industries. We also acknowledge that peak Agricultural industry bodies such as the National Farmers' Federation, their state counterparts and Industry associations play a key role in encouraging the adoption and uptake of best data practice, whether that be through Agricultural Data Rules, a Data Code of Practice or by other means.

1.2 What is Best Practice for Agricultural Data?

Agricultural Data Rules require the organisation and implementation of policies, procedures, structures, roles and responsibilities that outline rules of engagement for the effective management of agricultural data assets.

Best Practice will create an enabling environment in which innovation occurs by:

- Establishing roles and responsibilities to be accountable for decisions related to agricultural data;
- Establishing policies, procedures and institutional arrangements to manage agricultural data;
- Promoting sharing of agricultural data (where possible);
- Building trust in the collection, use and sharing of agricultural data; and
- Ensuring appropriate safeguards to protect against risks associated with misuse of agricultural data.

1.3 The Importance of Best Practice for Agricultural Data

For Australian agriculture and Australian farmers and producers to achieve the productivity gains possible from the new and emerging digital technologies, there is an urgent and continuing need to build up trust in the way that agricultural data is collected, managed and shared. For trust to be developed, Australian farmers and producers must be confident that, should they wish to share their agricultural data, their data is being managed in ways that protect their privacy, provide assurance in relation to the ethical use, security and safety of data and that risk and liability is allocated appropriately.

The rewards and risks of sharing agricultural data are great. Yet around the world, the issue of what is best practice for the governance of agricultural data is still being debated. For Australian agriculture, we suggest a crucial first step is the development of Australia-wide agricultural data rules, which will encourage the adoption of best management practice principles in agricultural data management. **This will bring transparency and trust around the collection, use and sharing of agricultural data**.

Agricultural data must be managed like any other asset. This will facilitate better control and use of agricultural data to achieve productivity gains and regulatory compliance, and reduce risks. Best practice in data management is an important first step. Indeed, "buy in" is vital to the success of agricultural data management principles and policies and is one of the main challenges for voluntary schemes such as Agricultural Codes of Conduct (such as those adopted in the US, NZ and EU) and the associated certification and accreditation practices.

1.4 Purposes and Aims of Australian Agricultural Data Rules

Australia's Agricultural Data Rules must be underpinned by clear purposes and aims. Most broadly, the aims of agricultural data rules are to create an enabling environment in which data can be collected, managed and shared appropriately. There are other purposes for establishing clear and consistent data rules including:

- **Improvement of processes**: including improving agricultural data quality, regulatory compliance and more effective use of agricultural data to achieve defined goals; and
- **Reduction of risk**: including risk management, data security and privacy.

1.5 What is Agricultural Data?

Agricultural and farm data can be defined in a number of ways. For example, the *EU Code of Conduct on Agricultural Data Sharing by Contractual Agreement* (2018) defines agricultural data as including farm data; machine data; service data; agri-supply data (input); and agri-service provider data.

For the purposes of these agricultural data rules, we define agricultural data to incorporate two key (in some cases, interrelated) aspects:

Farmer data: includes data relating to the individual (i.e. personal data such as names, addresses, financial and other information as defined as 'personal information' under Australia's *Privacy Act*) and non-personal farmer data (such as property boundaries).

Farm data: includes soil, climate, weather, agronomic, machine/service and input data.

Importantly, farmer and farm data are often interrelated and unable to be easily separated. Further, it should be recognised that once either farmer or farm data is aggregated by business or along the supply chain, this data takes on different characteristics and is regulated by the data aggregators through their data licences and terms of use.

1.5.1 Distinction between personal and non-personal

Not all data and information are treated equally. Importantly, *Australian Privacy Law* distinguishes between different types of data or information – that is, personal and non-personal information. Put simply:

- 'Personal information' is data or information that can be used to identify a person, such as name, address, location data, telephone number, medical records and bank account details.
- 'Non-personal information' is data or information that cannot be used to identify a person.

Often, data such as agronomic data, machine data and weather data is non-personal information. However, this is not always a simple distinction to make.

The distinction between personal and non-personal information is an important one to make because under *Australia's Privacy Act 1988*, a set of *Australian Privacy Principles (APPs)* exist that apply only to 'personal information'. While not legally binding, the draft **Guide to Big Data and the Australian Privacy Principles** (the Guide) outlines key privacy requirements and encourages the implementation of the Privacy Management Framework to facilitate big data activities while protecting personal information. The Guide sets out considerations and privacy tips, which are useful for ensuring compliance with *APP guidelines and the Privacy Act 1988* when handling personal information for big data activities.

The Guide encourages entities to use big data and to conduct big data activities in a way that personifies the privacy principles, and includes matters such as:

- ensuring that personal information is collected through 'lawful and fair means';
- that data is only disclosed for the primary purpose for which it was created;
- how entities should ensure the quality and security of the information they possess; and
- 'tak[ing] reasonable steps to protect the information from misuse, interference and loss, as well as unauthorised access, modification or disclosure'.

It is important to note, however, that the APPs specifically concern ‘personal information’. By contrast, ‘non-personal information’ is generally governed by the law of contract, i.e. the data licences that parties enter.

2 Agricultural Data Rules: Enabling Best Practice

The foundation of Australia's Agricultural Data Rules is **People, Responsibilities and Structures**. Without the right people - their roles and responsibilities - and structures in place around agricultural data, best practice in the management of agricultural data will not be achieved.

In addition to **People, Responsibilities and Structures,** there is a need for **Data Policies and Procedures** to be in place. A further fundamental aspect is **Capacity and Capability Building**. Best practice around agricultural data also requires awareness of the **Risk, Regulation and Compliance** involved to mitigate risks and improve efficiencies. Accordingly, there are three pillars that underpin best management practices around data rules:

1. **Policies & Procedures;**
2. **Capacity & Capability;** and
3. **Risk, Regulation & Compliance.**

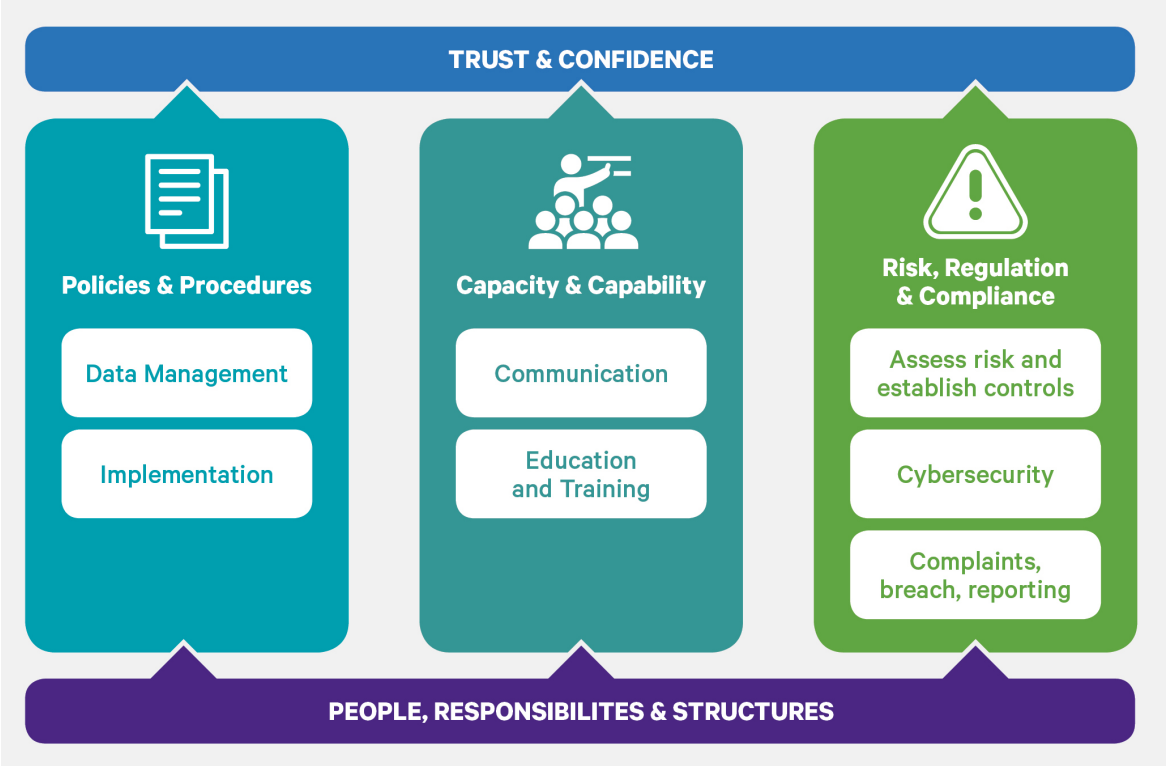

Figure 1: Agricultural Data Rules: Enabling Best Practice

2.1 Foundation: People, Responsibilities and Structures

Overview of People, Responsibilities & Structures:

- Identification of current data practices will assist farmers and agri-businesses to identify strengths and weaknesses within their data management practices within their organisations. This will assist agri-businesses identify the steps that need to be taken to allocate appropriate data management roles, responsibilities and structures.
- To support their farming communities, peak industry bodies and associations should also develop and/or review current data management practices and identify the steps that need to be taken to allocate appropriate data management roles, responsibilities and structures.
- Identifying roles, responsibilities and structures ensures the efficient and effective use of resources in managing data, and provides lines of accountability around data collection, use and sharing.
- Agri-businesses (including advisers), industry associations and RDCs are advised to have a designated individual (e.g. Data Steward) to identify data flow and existing data practices. This is necessary to shape and manage practices around data collection, use and sharing. This should include identification of any third-party sharing arrangements.
- Key aspects of a Data Steward's role include:
  - Having responsibility over the identification and management of agricultural data including the collection, use and sharing of data.
  - Awareness of legal and regulatory requirements such as intellectual property (including confidentiality), privacy and compliance (e.g. biosecurity, environmental).
- The position of Data Steward may not be a full-time position. Responsibility for data management could, in some cases, be assigned to an existing employee.

2.2 Pillar 1: Agricultural Data Management Principles and Policy

Overview of Ag Data Management Principles & Policies:

- Data Management Principles and Policies are required to ensure the collection, use and sharing of agricultural data is done in a consistent and effective manner.
- Principles and policies need to be consistent with the Australian Government's Data Sharing Principles and be legally compliant and consistent with other approaches and frameworks including:

- The **Five Safes**[1] is a framework for helping make decisions about the effective use of data, which is *confidential or sensitive.* This Framework provides a structure for assessing and managing disclosure risk that is appropriate to the intended data use. This framework has been adopted by the Australian Bureau of Statistics (ABS), several other Australian government agencies as well as national statistical organisations such as the Office of National Statistics (UK) and Statistics New Zealand.

- The Five Safes Framework provides a structure for assessing and managing disclosure risk that is appropriate to the intended data use.

    - Safe Projects: Is the use of the data appropriate?
    - Safe People: Can the users be trusted to use it in an appropriate manner?
    - Safe Settings: Does the access facility limit unauthorised use?
    - Safe Data: Is there a disclosure risk in the data itself?
    - Safe Outputs: Are the statistical results non-disclosure?

- The **F.A.I.R Principles**[2] is another approach to optimising the reuse of **data**.

  These principles have received worldwide recognition by various organisations including FORCE11, National Institutes of Health (NIH) and the European Commission as a useful framework for thinking about sharing data in a way that will enable maximum use and reuse.

    - The F.A.I.R. Principles are a set of guiding principles for rendering data:

        - Findable;

          This includes assigning a persistent identifier (like a DOI or Handle), having rich metadata to describe the data and making sure it is findable through disciplinary discovery portals (local and international).

        - Accessible;

          This may include making the data open using a standardised protocol. However, the data does not necessarily have to be open. There are sometimes good reasons why data cannot be made open, for example, privacy concerns, national security or commercial

[1] See www.abs.gov.au; https://www.pmc.gov.au/public-data/data-sharing-and-release-reforms

[2] https://www.ands.org.au/working-with-data/fairdata

interests. If it is not open, there should be clarity and transparency around the conditions governing access and reuse.

- Interoperable;

  To be interoperable the data will need to use community agreed formats, language and vocabularies. The metadata will also need to use a community agreed standards and vocabularies, and contain links to related information using identifiers; and

- Reusable;

  Reusable data should maintain its initial richness. For example, it should not be diminished for the purpose of explaining the findings in one particular publication. It needs a clear machine readable licence and provenance information on how the data was formed. It should also have discipline-specific data and metadata standards to give it rich contextual information that will allow for reuse.

While there are differences between the two approaches of Five Safes and F.A.I.R, both approaches ensure that confidential and sensitive (and personal) data are treated in appropriate ways with appropriate safeguards.

Agricultural Data Principles should reflect high-level strategic approaches to data management. Perhaps most importantly, **honesty and transparency** in the way data is managed should be the primary goal when developing data management principles.

Matters that should be addressed by Data Management Principles are:

- Ownership, control and custody of data;
- Sharing of data; particularly any third-party access;
- Accessibility, usability and interoperability of data;
- Accuracy and suitability of data;
- Safety, security and de-identification; and
- Mechanism for review.

While each sector needs to develop its own Principles and Policies, a general example is provided in Appendix 1. That said, one fundamental question related to data principles and policies is whether data should, in certain circumstances, be made open? Internationally, it has been accepted that agriculture would benefit from open data however, it is also important to allow for restrictions in certain circumstances including regulatory obligations (including privacy, security). An example of open data principle or contractual provision (that allows for and encourages data sharing) is:

'Best efforts shall be used to make all data open access, subject to the legal rights and legitimate interests of stakeholders and third parties, including intellectual property rights, confidentiality, and privacy.'

Implementation of Ag-Data Policies and Procedures

- There are numerous organisations that collect, use and share agricultural data so implementation of data management practices needs to be varied (i.e. It is not a one-size fits all approach).
- Different implementation strategies may be needed for farmers and agri-businesses.
- Barriers to implementation include a general lack of awareness of the potential risks that may arise from misuse or incorrect data sharing practices that may expose farmers and agri-businesses to legal liabilities.
- To improve agricultural data management practices, some countries have adopted voluntary Agricultural Data Codes of Practices: such as in the US (2014), NZ (2014) and the EU (2018). Importantly, though, Agricultural Data Codes of Practice are one piece of the larger puzzle of how best to protect farmers and their data while maximising the potential for agriculture.

  The National Farmers' Federation (NFF) is developing an Australian Farm Data Code of Practice, and it is anticipated that a draft code will be made available at the end of 2019.
- In order to facilitate implementation, it may be useful to consider the introduction of a data traffic-light system. For example:

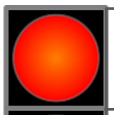	Personal or sensitive information that cannot be shared
	Information that can be shared in certain circumstances (e.g. where informed consent is provided)
	Data that is in the public domain

Table 1. Data traffic-light system

2.3 Pillar 2: Capacity and Capability

Overview of capacity and capability:

- Given that Best Practice in Agricultural data rules is between 80 and 95% communication (Hopwood, 2018), training, education and awareness raising will ensure that best practice will become part of day-to-day work practices.

- Agri-businesses need to develop transparency around the terms of their data collection, management and sharing approaches. For farmers, it is important to know what issues to look for in, and questions to ask about, data contracts. Indeed, as with entering into any contractual relationship, it is critical that farmers read and understand the fine print of their data contract and ask questions rather than just click on the "I agree" or sign the contract.

  Agribusiness and farmers should ask the following questions about data contracts:

  1. Who owns or controls the management of data collected?
  2. Is the data being shared? If so, with whom?
  3. Who has access to the data?
  4. How will the data be used?
  5. How is the data aggregated? If so, does the aggregation protect the data contributors?
  6. Is there Personal Data or Personal information contained in the data?

     (i.e. is the personal information/data protected by the Privacy Policy of the company and Australian Privacy Law?)
  7. Is the appropriate anonymisation or de-identification in place?
  8. Can the data be accessed and withdrawn?
  9. What happens if there is a data breach, i.e. which laws apply?

2.4 Pillar 3: Risk, Regulation and Compliance

Overview of risk, regulation and compliance:

- Best Practice Data Rules must consider issues of risk, regulation and compliance.

  There are legal obligations, duties and responsibilities around **privacy and confidentiality** aspects of data, particularly when data is shared or released.

  For example, a current requirement is mandatory notifications of breach that was introduced by the *Privacy Amendment (Notifiable Data Breaches) Act 2017* (Cth) in

2017. Recognising that notification of a breach can limit damage, and promote transparency, agencies and organisations governed by the *Privacy Act 1988 (Cth)* are obliged to notify the Privacy Commissioner and affected customers 'as soon as practicable' after becoming aware that a data breach has occurred. It also should be noted that, where an organisation *suspects* that a data breach has occurred, it is required to assess whether a breach has in fact occurred.

The Office of the Australian Information Commissioner (OAIC) provides numerous resources and guides on the Notifiable Data Breach Scheme. For example:

- Data Breach Preparation and Response: A guide to managing data breaches in accordance with the Privacy Act 1988 (Cth)
- Four Key Steps to responding to a data breach
- Guide to Securing Personal Information

While it is only certain Australian Government Agencies and Organisations with an annual turnover of $3 million (and some other organisations) that handle personal information that are bound by the *Privacy Act 1988* (Cth) and the 13 Australian Privacy Principles, these laws and resources provide important signals - and useful resources - for other sectors including Australian Agriculture.

There are also **competition and consumer laws** that may impact upon agricultural data collection and aggregation practices, for example, there are Unfair Terms laws within in the *Australian Consumer Law* (ACL) and anti-competitive provisions of the *Competition and Consumer Act 2010* (CCA).

The competition and privacy aspects of data collection more generally have recently been examined by the ACCC in its **Final Report on the Digital Platforms Inquiry** (ACCC, 2019). While the inquiry focussed on anti-competitive behaviour and the market power of tech giants such as online search engines, social media and digital content aggregators, the recommendations highlight the view of the Government that Australia's legal and regulatory framework needs to be updated to ensure it was "fit for purpose" to respond to the unprecedented and unforeseen growth in data aggregation. This signals the Government is taking the protection of individual's privacy very seriously and that it is willing to take steps to ensure that there is informed consent gained prior to data sharing.

This stance is in line with the recent introduction of the **Consumer Data Right** in Australia, giving individuals more control over personal data collected about them.

Both of these developments highlight the importance of compliance with the legal and regulatory aspects of data collection, management and use.

In addition to specific data laws and regulations, some farmers and agri-businesses need to comply with, and manage risks from, various other legal frameworks around environment, biosecurity and workplace health and safety issues.

- To manage the risks associated with data collection, use and sharing, farmers and businesses must have a dedicated Data Steward (See People, Responsibilities and Structures).
- For relevant bodies, the Australian Government Information Security Manual 2019 provides guidance on approaches to those issues.

3 Implementation and Action Plan

In order to adopt and implement **Agricultural Data Rules: Enabling Best Practice** the following actions need to be taken as a priority:

Action 1: Appoint data stewards.

Action 2: Identify data roles, responsibilities and structures.

Action 3: Develop data management policies and procedures.

Action 4: Implement data management policies and procedures, starting with:

i. *Introduction of a Farm Data Code of Practice:* A code of practice can raise awareness around data use and streamline data practices within Australia. While this may eventually include an option for certification and an associated branding strategy (e.g. a logo), it is recommended that Principles are first developed, agreed upon and socialised.

Action 5: Build capacity and capability around data management, starting with:

i. *Data management education and training programs;* and

ii. *Awareness raising of the risk, regulation and compliance requirements of data management*

Action	2020													
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1. Appoint data stewards														
2. Identify data roles, responsibilities and structures														
3. Develop data management policies and procedures														
4. Implement data management policies and procedures														
5. Build capacity and capability around data management														

Table 2. Data Rules Action Plan and Timeline

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Appendix 1: Example Data Management Principles

Preamble

We recognise that good data management is essential to delivering world-class outcomes that benefit Australian Agriculture.

We recognise that a key aspect of good data management involves clarity around who holds the rights to the data and who can access that data and upon what terms.

We will generally not own data but will be a data custodian, managing data for the benefit of Australian Agriculture.

These Data Management Principles supplement our **Privacy Policy** and must be read in conjunction with the **Privacy Policy** as well as the *Australian Privacy Principles and Guidelines* and the *Privacy Act 1988 (Cth).*

Scope of the *Data Management Principles*

The Data Management Principles apply, where possible, to all generated, received or processed data including raw and processed data, and data created by, as well as data provided to, producers or processors.

The Data Management Principles apply to internal and external data interactions.

Data may be requested by third parties for research and compliance monitoring. Where possible, and when it is in the best interests of Australian Agriculture, we will ask third parties to comply with these Data Management Principles.

Principle 1 – Honesty and Transparency

We will act honestly and transparently when collecting, using and sharing data, and will disclose how we manage data.

Principle 2 – Custodianship/Stewardship

Where we have originally commissioned the data and has managerial and financial control of the data or data set, we claim custodianship/stewardship over the data, and will management that data in accordance with these principles.

Principle 3 – Data Sharing

Best efforts will be used to make all data open access, subject to the legal rights and legitimate interests of stakeholders and third parties, including intellectual property rights, confidentiality and privacy.

Principle 4 - Accessible and Interoperable

We are committed to the use and sharing of data by making data as accessible, interoperable and accessible as possible.

To make data as accessible as possible, we will take reasonable steps to ensure that data is findable, interoperable and reusable.

We acknowledge, however, that in certain situations, there are good reasons to keep some or all data restricted or closed. For example, data may be restricted or closed when it is subject to intellectual property rights, confidentiality and privacy, and where it is in the best interests of Australian Agriculture.

We will not share data with third parties without asking for and receiving explicit permission to do so, except as required by law.

Principle 5 - Safety, security and de-identification

We will ensure that data is collected and stored securely. To achieve this, we will, as appropriate:

- organise and secure data in accordance with our Privacy Policy; and
- ensure that data is stored and shared in a de-identified form unless required under law, unless it is not technically possible, or it is not in the interests of the Australian Agriculture.

Principle 6 – Third Parties

We will, where possible, request third parties when dealing with data to act in accordance with the Data Management Principles.

Principle 7 – Review

We will regularly review and audit the way in which we manage data.