

# Meeting 4 of the Soil RD&E Implementation Committee

<b>Location</b>	NSW Trade & Investment Centre, Zig Zag Room, Level 47, MLC Centre, 19 Martin Place, Sydney.
<b>Date</b>	Thursday 26th November 2015
<b>Attendees</b>	
Georgina Kelly	New South Wales Department of Primary Industries (Acting Chair)
Neil McKenzie	CSIRO Agriculture, Canberra
Hamish Cresswell	CSIRO Agriculture, Canberra
Jennifer Alexander	Department of Economic Development, Jobs, Transport & Resources, Bendigo
Budiman Minasny	The University of Sydney (for Alex McBratney)
Ian Anderson	University of Western Sydney, Richmond, NSW
Michael Crawford	Department of Economic Development, Jobs, Transport & Resources, Bendigo
Daniel Brough	Department of Science, Information Technology, Innovation and the Arts, Brisbane
Jim Cox	South Australian Research and Development Institute, Adelaide (for Pauline Mooney)
Allan Williams	Cotton Research and Development Corporation, Narrabri
Vicki Woodburn	Rural Industries Research and Development Corporation, Canberra
Cameron Allan	Meat and Livestock Australia, North Sydney
Sharon Harvey	Wine Australia (Grape and Wine Research and Development Corporation), Adelaide
Michele Barson	Department of Agriculture
Felice Driver	Sugar Research Australia
Cathy Phelps	Dairy Australia
Brenda Kranz	Horticulture Innovation Australia
Jason Hill	Department of Land Resource Management, Palmerston, NT
Karen Holmes	Department of Agriculture and Food Western Australia, Perth (for Noel Schoknecht)
Warwick Dougherty	New South Wales Department of Primary Industries, Camden
Major General the Hon. Michael Jeffery	National Advocate for Soil Health
<b>Apologies</b>	Paul Lawrence (DSITI), Jan Edwards (GRDC), Alex McBratney (University of Sydney), Pauline Mooney (SARDI), Peter Voller (DPIPWE), Iain Young (UNE)

# Agenda

9:00 Coffee and tea available on arrival

9:30 Welcome

9:35 ITEM 4.1: Minutes of last meeting and correspondence

9:50 ITEM 4.2: Member updates (2-3 minutes on key developments)

10:40 ITEM 4.3: Round 2 of Rural R&D for Profit

11:10 Morning Tea

11:30 ITEM 4.4: Update from the Advocate for Soil Health

12:00 ITEM 4.5: Forum planning

13:00 Lunch

13:45 ITEM 4.6: R&I committee presentation on Soil Strategy

14:05 ITEM 4.7: Outline of the proposed Soil RDE website

14:20 ITEM 4.8: Update on the Global Soil Partnership

14:40 ITEM 4.9: Update on Soil RDE implementation activities (including working group reports)

15:00 ITEM 4.10: Update on monitoring and forecasting of soil-water projects

15.10 ITEM 4.11: Budget report

15:20 ITEM 4.12: 2016 meeting dates

15:50 Reflections on progress and other business

16:00 Close

Soil RD&E Implementation Committee	Meeting Number: 4
	Location: Sydney
	Date: 26 <sup>th</sup> November 2015
AGENDA Paper	ITEM 4.1
<b>Minutes of last meeting and correspondence</b>	
<p><b>Background</b></p> <p>The minutes of Meeting 3 of the Soil RD&amp;E Implementation Committee are presented for review and endorsement (Attachment 1).</p>	
<p><b>Key issues</b></p> <p>None identified.</p>	
<p><b>Required action</b></p> <p>For review and endorsement.</p>	
<p><b>Resource implications</b></p> <p>None</p>	
<p><b>Preparation and consultation</b></p> <p>Soil RD&amp;E Secretariat.</p>	
<p><b>Attachments</b></p> <p>Minutes of Meeting 3 of the Soil RD&amp;E Implementation Committee (separate document).</p>	

Soil RD&E Implementation Committee	Meeting Number: 4
	Location: Sydney
	Date: 26 <sup>th</sup> November 2015
AGENDA Paper	ITEM 4.2
<b>Member updates</b>	
<p><b>Background</b></p> <p>It was agreed at Meeting 1 that members of the Implementation Committee would provide written updates that highlight key developments, challenges and emerging issues for their organization. A brief 3-5 minute verbal summary of these would be provided at the meeting.</p>	
<p><b>Key issues</b></p> <p>The intent is to provide all members with a clearer understanding of soil RD&amp;E matters across all jurisdictions and organizations. With time, members should develop a more collegiate and integrated understanding of soil management across Australia.</p>	
<p><b>Required action</b></p> <p>Members are requested to provide a brief 3-5 minute verbal summary at the meeting.</p>	
<p><b>Resource implications</b></p> <p>Minor. Members will normally draw on existing review and reporting materials from their organization.</p>	
<p><b>Preparation and consultation</b></p> <p>Soil RD&amp;E Secretariat with input from members of the Soil RD&amp;E Implementation Committee.</p>	
<p><b>Attachments</b></p> <p>None</p>	

Soil RD&E Implementation Committee	Meeting Number: 4
	Location: Sydney
	Date: 26 <sup>th</sup> November 2015
AGENDA Paper	ITEM 4.3
<b>Round 2 of Rural R&amp;D for Profit</b>	
<p><b>Background</b></p> <p>The \$100 million Rural R&amp;D for Profit program will provide grants to RDCs for collaborative research that enhances farm-gate profitability and supports continuing innovation in Australia's primary industries. The program implements the Australian Government's 2013 election commitment to provide additional funding to the RDCs. The research is to focus on delivering cutting-edge technologies and making research findings more accessible for primary producers. It must also improve coordination and cooperation between stakeholders.</p>	
<p><b>Key issues</b></p> <ul style="list-style-type: none"> <li>• The second round of the Rural R&amp;D for Profit program opened in October. RIRDC has coordinated the initial process for soil-related bids.</li> <li>• The Implementation Committee's role in the process has been to encourage an open, effective and inclusive process. The intent was to ensure proposals were developed that related to the five national soil RD&amp;E priorities.</li> <li>• A discussion on the process is timely including consideration of what has worked well and where improvements can be made for future calls.</li> </ul>	
<p><b>Required action</b></p> <p>For discussion</p>	
<p><b>Resource implications</b></p> <p>None</p>	
<p><b>Preparation and consultation</b></p> <p>Soil RD&amp;E Secretariat</p>	
<p><b>Attachments</b></p> <p>None</p>	

Soil RD&E Implementation Committee	Meeting Number: 4
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AGENDA Paper	ITEM 4.4
<b>Update from the Advocate for Soil Health</b>	
<p><b>Background</b></p> <p>The mission of the Advocate for Soil Health, General Michael Jeffery, is to ‘provide strong leadership and advocacy on the importance of healthy soil, water and vegetation and the benefits thereof for all Australians.’</p> <p>A specified task in the terms of reference for the Soil Advocate is to ‘work towards ensuring that existing and new soils research meets the needs of Australia’s farmers and other soil managers.’ The related implied task outlined in the terms of reference is to ‘engage with the National Implementation Committee for the National Soil Research, Development and Extension Strategy through regular meetings and correspondence.’</p>	
<p><b>Key issues</b></p> <p>At its third meeting, the Implementation Committee resolved to assist the Advocate for Soil Health with the proposed 100 case-studies proposal in preparation for submission to the Rural R&amp;D for Profit call. An update on progress will be provided.</p> <p>The Advocate will also provide an update on other activities including reporting to the Australian Government.</p>	
<p><b>Required action</b></p> <p>For information and consideration.</p>	
<p><b>Resource implications</b></p> <p>None at this stage.</p>	
<p><b>Preparation and consultation</b></p> <p>Soil RD&amp;E Secretariat</p>	
<p><b>Attachments</b></p> <p>None</p>	

Soil RD&E Implementation Committee	Meeting Number: 4
	Location: Sydney
	Date: 26 <sup>th</sup> November 2015
AGENDA Paper	ITEM 4.5
<b>Forum planning</b>	
<p><b>Background</b></p> <p>At Meeting 3, the Implementation Committee agreed that the focus for the Soil RD&amp;E Forum should be the preparation of the position paper at Outlook 2016. It was also agreed that the paper could cover:</p> <ul style="list-style-type: none"> <li>• Institutional arrangements for Soil RD&amp;E (including the unresolved arrangements for proceeding with the Australian Soil Assessment Program)</li> <li>• The value of soil research to Australia</li> <li>• Implications of changes in global food security for Australia</li> <li>• Export opportunities for Soil RD&amp;E services</li> <li>• Current expertise and modes of implementation for RD&amp;E.</li> </ul> <p>As a first step, members of the Executive met on the 9<sup>th</sup> November with Toss Gascoigne, a consultant with extensive experience in science communication and strategy development. The primary purpose was to discuss how we could plan for the Annual Forum and take advantage of the opportunity presented by Outlook 2016. Members of the Executive also discussed how to develop an integrated analysis of the economic benefits of managing soil data and the monitoring of land-use and land-use change, and the links through to agricultural productivity and sustainability (Action Item 3.8 from Meeting 3).</p> <p>Toss Gascoigne provided an insightful and helpful analysis of the strengths and weaknesses of the Soil RD&amp;E initiative to date. Some of his observations included the following.</p> <ul style="list-style-type: none"> <li>• Apart from the Advocate for Soil Health, the Soil RD&amp;E initiative lacks champions to push it along. The present position is that a lot of groundwork has been done but the political and funding process has stalled.</li> <li>• Soil issues are important, chronic and long-term, but do not manifest as immediate and public 'crises' like water. They lack dramatic appeal ('Yes, the sky IS falling but in slow-motion')</li> <li>• The proposal to commission an organisation or individual to prepare a cost-benefit analysis is unlikely to be useful because it would be tainted by self-interest. Conversely, asking an independent agency such as the Productivity Commission to undertake such an analysis may have another set of uncontrolled risks.</li> </ul> <p>Toss Gascoigne emphasized that an important starting point was to build a broad constituency of support. Some practical actions could include:</p> <ul style="list-style-type: none"> <li>• A National Press Club function to build the profile and establish the lead position in sector</li> <li>• Use models like Climate Champions to establish network of committed farmers to spread information and messages relating to the sustainable management of soils.</li> <li>• Work with existing networks associated with organizations already on the Implementation Committee (e.g. existing Advisory Committees)</li> </ul>	

- Find non-researchers to champion the Implementation Committee’s cause
- Influence discussions in key forums (e.g. Australian Farm Institute) and look for alliances with groups with overlapping interests
- Commission and contribute to influential media (e.g. more articles for the *The Conversation*, blogs such as *Pearls and Irritations* and a full program for Radio National’s *Big Ideas*)
- Drawing up a list of the “Top 100” people who must be kept informed about our plans and activities (as done by Professor Peter Cullen during the period of water reform)

Toss Gascoigne suggested that the Implementation Committee needs to:

- strengthen its position by building a strong and *unified* case acceptable to all parties (CSIRO, universities, Deans of Agriculture, RDCs, industry)
- build alliances with groups sharing over-lapping interests (e.g. Landcare, NFF)
- involve influential individuals to extend our network
- prepare a simple document setting out what we want to do and why it’s important. Toss was emphatic that there should be no scientific or bureaucratic jargon. He also bemoaned the quality of language used in our core documents.

In conclusion, he suggested we need to make our case by:

- starting with domestic arguments (e.g. better soil care leads to more export income and more rural jobs)
- emphasizing the danger of squandering our future by ‘mining’ the soil
- retaining but downplaying the international arguments for sustainable soil management because they will probably be less influential within Australia (e.g. issues of food security and regional stability).

### **Key issues**

It is essential to develop a clear message and plan of action at the Annual Forum which will be held on the 2<sup>nd</sup> and 3<sup>rd</sup> of February, only a few weeks prior to Outlook 2016.

A consensus is needed on the proposed approach and mode of action. Some of the commentary by Toss Gascoigne provides a starting point for discussion.

### **Required action**

Members are requested to respond to the background material and provide guidance on both the format and content of the Annual Forum.

### **Resource implications**

A proportion of costs for the Annual Forum will be covered by the Soil RD&E Strategy.

### **Preparation and consultation**

Soil RD&E Secretariat, Executive and supporting material provided by Toss Gascoigne.

### **Attachments**

None

Soil RD&E Implementation Committee	Meeting Number: 4
	Location: Sydney
	Date: 26 <sup>th</sup> November 2015
AGENDA Paper	ITEM 4.6
<b>R&amp;I committee presentation on the Soil RD&amp;E Strategy</b>	
<p><b>Background</b></p> <p>The Research and Innovation (R&amp;I) Committee, formerly known as the Research, Development and Extension Committee, is responsible for the oversight of the development and implementation of the National Primary Industries RD&amp;E Framework. The Soil RD&amp;E Implementation Committee is required to report to the R&amp;I Committee biannually with the second report submitted by 31 December 2015. The R&amp;I Committee meets quarterly, with four Strategies invited to report on their progress directly to the Committee at these meetings. Iain Young is a member of the R&amp;I Committee.</p>	
<p><b>Key issues</b></p> <ul style="list-style-type: none"> <li>• The Soil RD&amp;E Strategy is scheduled to report in-person to the R&amp;I Committee at its first meeting in 2016.</li> <li>• Agreement is needed on the approach to reporting including the balance between current and proposed activities.</li> </ul>	
<p><b>Required action</b></p> <p>Members are asked to provide guidance on the content and focus of the report.</p>	
<p><b>Resource implications</b></p> <p>Funds to cover travel costs for one or more members may be required.</p>	
<p><b>Preparation and consultation</b></p> <p>Soil RD&amp;E Secretariat</p>	
<p><b>Attachments</b></p> <p>None</p>	

Soil RD&E Implementation Committee	Meeting Number: 4
	Location: Sydney
	Date: 26 <sup>th</sup> November 2015
AGENDA Paper	ITEM 4.7
<b>Outline of the proposed Soil RDE website</b>	
<p><b>Background</b></p> <p>The development of a website is required by the Soil RD&amp;E strategy (section 6.3). The purpose of the website is to provide information on implementation activities and related outputs.</p> <p>The content of the website will include the priorities for soil RD&amp;E, activities of the Implementation Committee, updates from the working groups and a news function.</p> <p>Links to sector-specific projects will provide a snapshot of existing soil RD&amp;E activities along with connections to the other RD&amp;E strategies. A key feature of the website will be the emphasis on links to other soil websites that provide access to data and information resources (for example, the healthy soil knowledge bank, <a href="http://soilquality.org.au">soilquality.org.au</a>, ASRIS, ACLEP, the Australian Soil and Landscape Grid and Soil Science Australia).</p> <p>Green Graphics have been engaged to develop the overall look and structure of the new website using WordPress. The art work from the soil strategy has been used as the basis for the design.</p>	
<p><b>Key issues</b></p> <p>A test website is available to view: <a href="http://jammedmedia.net/csiro/">http://jammedmedia.net/csiro/</a></p> <p>The contents and images have not been finalised but are there to give a feel for what the website will look like. The domain name will be soilstrategy.net.au and the site will be transferred to the CSIRO server in the coming weeks.</p>	
<p><b>Required action</b></p> <p>Review the link for the layout of the website for comment or endorsement.</p>	
<p><b>Resource implications</b></p> <p>Population of the content will be done by the Executive Officer once the site is transferred.</p>	
<p><b>Preparation and consultation</b></p> <p>Soil RD&amp;E Secretariat.</p>	
<p><b>Attachments</b></p> <p>None</p>	

Soil RD&E Implementation Committee	Meeting Number: 4
	Location: Sydney
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AGENDA Paper	ITEM 4.8
<b>Update on the Global Soil Partnership</b>	
<p><b>Background</b></p> <p>The <b>Global Soil Partnership</b> is a voluntary partnership, open to governments, regional organizations, institutions and other stakeholders at various levels. The Australian Government is a default partner because it is an FAO member country. Other Australian partners include CSIRO, the University of Sydney and Soil Science Australia. Michele Barson (Australian Government Department of Agriculture and Water Resources) is the Focal Contact for the GSP in Australia.</p> <p>The <b>Intergovernmental Technical Panel on Soils (ITPS)</b> provides scientific and technical advice on global soil issues. Members of the ITPS are nominated by the GSP Plenary Assembly for an initial term of 2 years, renewable for one additional term. Neil McKenzie (CSIRO) and Dr. Siosuia Halavatau (Secretariat of the Pacific Community, Fiji) are the current representatives for the Southwest Pacific region.</p> <p>The <b>Global Soil Partnership Secretariat</b> is the coordination and facilitation body in charge of facilitating the implementation of the GSP actions through its regional partnerships and networks. The GSP is hosted by FAO.</p> <p><b>Regional Soil Partnerships</b> are formed among interested and active stakeholders in the regions. These RSPs work in close coordination with FAO Regional Offices and establish an interactive consultative process with national soils entities and relevant regional institutions. The Southwest Pacific Regional Soil Partnership was established in 2014.</p> <p>The <b>Global Soil Partnership Plenary Assembly</b> is the main yearly meeting of ITPS members, GSP Executive Secretariat, representatives of the different partners and members to FAO. This assembly is in charge of reviewing and prioritizing GSP actions, and facilitating a balanced regional decision-making process.</p>	
<p><b>Key issues</b></p> <p>The International Year of Soils has been organized by the GSP and as the year draws to a close, several significant activities are being finalized. They include:</p> <ul style="list-style-type: none"> <li>• Release of the Status of the World Soil Resources Report (Attachment 1)</li> <li>• Establishment of the International Network of Soil Information Institutions (Attachment 2)</li> <li>• Release of the Revised World Soil Charter (Attachment 3)</li> </ul> <p>New activities are starting including the development of Voluntary Guidelines on Sustainable Soil Management which aims to complement the Revised World Soil Charter.</p>	
<p><b>Required action</b></p> <p>For Information.</p>	

**Resource implications**

None at this stage.

**Preparation and consultation**

Soil RD&E Secretariat

**Attachments**

Attachment 1: Release of the Status of the World Soil Resources Report

Attachment 2: Establishment of the International Network of Soil Information Institutions

Attachment 3: Release of the Revised World Soil Charter (see separate file as well)

# Attachment One: Release of the Status of the World Soil Resources Report

## Introduction

The Status of the World Soil Resources Report (SWSR) will be released on the 4<sup>th</sup> of December at FAO headquarters in Rome. The report will be officially launched at a high-level event which will also mark this year's celebration of World Soil Day and the official closure of the 2015 International Year of Soils.

## Purpose of the report

The purpose of the report is to provide the first global assessment of soils and soil change. It provides an overview of soil condition and trends at the global level along with more detailed regional assessments. The report focuses on threats to soil function including soil erosion, soil organic carbon change, soil biodiversity changes, soil acidification, soil compaction, soil sealing, soil salinization and sodification, soil contamination, soil nutrient changes and water logging. The report's findings are based on an extensive review of published scientific literature (rather than the often cited but misleading 'grey literature').

## Key findings

The overwhelming conclusion from the report is that the majority of the world's soil resources are in only fair, poor or very poor condition. Detailed regional reports and case studies contained in the report confirm that while there is cause for optimism in some regions, conditions are getting worse in far more cases than they are improving. The most significant threats to soil function at the global scale are soil erosion, loss of soil organic carbon and nutrient imbalance.

## Contributors

The report was prepared by the Intergovernmental Technical Panel on Soils (ITPS) and is based on text provided by more than 200 coordinating lead authors and authors from over 60 countries. The text was reviewed by many experts including government reviewers. FAO and the Global Soil Partnership (GSP) provided editorial management and editing/publication facilities. The European Union provided financial resources.

## Format and availability

The main report is large (~800 pages) and is accompanied by a Technical Summary (90 pages). A Summary for Policy makers will also be released. The report is aimed at scientists, the general public and policy makers alike. The report will be available for download directly from the [FAO Document Repository](#).

## Attachment Two: Establishment of the International Network of Soil Information Institutions

Many of the issues identified by the National Committee on Soil and Terrain in its proposed Australian Soil Assessment Program have parallels in other countries. The Global Soil Partnership is aiming to address many of these issues at an international level through its development of plans of action relating to Pillars [Four](#) and [Five](#) of the GSP:

- Pillar Four: Enhance the quantity and quality of soil data and information: data collection (generation), analysis, validation, reporting, monitoring and integration with other disciplines
- Pillar Five: Harmonization of methods, measurements and indicators for the sustainable management and protection of soil resources

The implementation phase of Pillar Four is now underway and a key step is to establish the proposed International Network of Soil Information Institutions. To this end, National Soil Information Institutions will meet at FAO Headquarters from 8-10 December.

The Australian Government will be represented by CSIRO at the meeting. The workshop will consider a detailed implementation plan for Pillar Four prepared by the GSP Secretariat. A copy of the implementation plan and a draft agenda for the meeting is available from the Soil RD&E Secretariat.

## Attachment Three: Release of the Revised World Soil Charter

The revised World Soil Charter was endorsed by the 39th FAO Conference in June 2015 in recognition of the urgent need to promote sustainable soil management by all stakeholders and at all levels. The Intergovernmental Technical Panel on Soils (ITPS) produced the new version of the World Soil Charter (WSC).

The first World Soil Charter (WSC) was conceived, negotiated and adopted by the FAO member countries at the 1981 FAO Conference. The more recently formed Global Soil Partnership (GSP) was duty-bound to promote its principles but it was clear that the soil challenges facing the world have become more evident and severe in the intervening decades. GSP Partners considered that the 13 principles listed in the original charter were still valid, but they needed to be updated and revised in light of issues that have emerged in the past 30 years including climate change, food security, environmental contamination and urban sprawl.

The original strong focus of the World Soil Charter was on land use planning and land evaluation. This had to be adjusted and the Revised World Soil Charter has been couched within the widely used ecosystem services framework.

The ITPS submitted the revised text to the GSP Plenary Assembly at its second meeting in July 2014. After further changes introduced by the Assembly, the Revised World Soil Charter was endorsed by the 24th session of the Committee on Agriculture (COAG) in October 2014 and by the FAO Council in December 2014.

Coinciding with the International Year of Soils, member countries during the 39th FAO Conference in June 2015 unanimously endorsed the new World Soil Charter as a vehicle to promote and institutionalize sustainable soil management at all levels. Members also welcomed and appreciated the work done by the Global Soil Partnership and requested full implementation of the World Soil Charter.

[Revised World Soil Charter attached as a separate document and downloadable from [here](#)]

Soil RD&E Implementation Committee	Meeting Number: 4
	Location: Sydney
	Date: 26 <sup>th</sup> November 2015
AGENDA Paper	ITEM 4.9
<b>Update on Soil RDE implementation activities (including working group reports)</b>	
<p><b>Background</b></p> <p>The Committee has discussed a range of initiatives at previous meetings to implement the strategy. The activities below have been raised as areas to focus on.</p> <ul style="list-style-type: none"> <li>• Preparation of the Soil RDE communication plan</li> <li>• Plain English version of the Soil RDE Priorities</li> <li>• Innovation competition and a big data Hack-a-thon</li> <li>• Pilot study into the value of knowledge exchange</li> <li>• Register of existing field sites</li> <li>• Update on trends in capability, capacity and investment in soil RD&amp;E.</li> </ul>	
<p><b>Key issues</b></p> <p><u>A plain English version of the priorities</u></p> <p>A Plain English version of the priorities has been developed by the reference group, Michael Crawford, Peter Voller and Ian Anderson. The audience for the Plain English version of the soil priorities is people who want to know more about the Soil RD&amp;E strategy but don't have a background in soil, including producers, industry and government. The reference group will test this version with a few people who work in communication within our organisations. The next step is to turn the document into a 'glossy' pdf for inclusion on the website and for distribution.</p> <p><u>Field site register</u></p> <p>The 2010-11 stocktake of Australia's current investment in soil RD&amp;E aimed to gather information on sites but the response rate for this section was not high. A register of sites could become part of our shared physical infrastructure. This process could help to capture information on the relevance of sites in an Australian context, providing information on the implications if sites face closure. A scope that covers the purpose of the register has been developed that also covers how the information can be used. The initial data collection will aim to capture a minimum amount of information as a starting point (baseline pH, nutrient status, sites where land use is changing).</p> <p>GRDC and Land and Water Australia reports cover some sites. Many other reports cover detail and the register could point to these.</p> <p>The aim is to run an on-line survey in February 2016 with a draft report compiled by the May meeting and finalised by August 2016. The product will be a database and a report that describes the relevance of sites in an Australian context.</p>	
<b>Required action</b>	

Review the Plain English version of the priorities and the long term site register outline and provide comment

Implementation Committee members are to nominate contacts within organisations to send the field site data request to. Also discuss contacting private farming groups for their input (Birchip, MSFS etc).

Working groups to report back to the Implementation Committee on their progress and planned future activities.

### **Resource implications**

The actions identified and their resourcing requirements will contribute to planning the expenditure of the budget for the Implementation Committee.

### **Preparation and consultation**

Soil RD&E Secretariat.

### **Attachments**

Attachment 1: A Plain English version of the priorities

Attachment 2: Long term soils research site register

Attachment One: Five key priorities for soil research, development and extension.

Current text	Plain English?
<b>Find solutions to soil-based constraints to agricultural productivity</b>	<b>Improving the ways farmers manage soil problems to get the best production and return.</b>
<b>Improve nutrient and water-use efficiency to increase productivity and minimise negative impacts (including acidification, eutrophication, leaching and agricultural greenhouse gas emissions)</b>	<b>Developing smart ways to manage water and nutrients to increase production while protecting the environment</b>
<b>Develop better information systems for soil-related knowledge exchange</b>	<b>Improving the ways that soil information is shared and used</b>
<b>Capture, verify and communicate innovation in soil management</b>	<b>Identifying and promoting new and innovative ideas in good soil management</b>
<b>More effective soil and land use policy</b>	<b>Ensuring that soil and land use policy is focussed and relevant</b>

**Improving the ways farmers manage soil problems to get the best production and return.**

Current text	Plain English?
<b>Actions</b>	
<p>Improve our understanding of soil function, soil formation, erosion rates remediation and restoration processes so we can design ways to achieve sustainable soil management.</p> <p>Develop rapid diagnostic systems for detection and response to soil-based constraints to root growth in crop, pasture and irrigation.</p> <p>Improve the rhizosphere (the soil-plant-interface) to enhance plant productivity and soil function, including by improving soil structure, supporting breeding programs for plants with improved root systems, storing carbon and learning to manipulate microbial diversity.</p> <p>Develop economically viable biological, chemical and/or physical methods to ameliorate unfavourable subsoil rooting conditions (e.g. compacted and dense soils, lack of macroporosity, acidified layers).</p>	<p><b>Understand more about how soils form, how they function and how soils can be best managed for long term production and environmental benefits.</b></p> <p><b>Invent tools to quickly detect soil-based limitations to crop and pasture growth and water infiltration.</b></p> <p><b>Explore ways to economically improve the soil around the roots of crops and pastures to improve production and sustainability. This includes improving soil structure, increasing soil organic matter and managing soil microbes.</b></p> <p><b>Finding new ways to fix problem soils to improve their productivity</b></p>
<b>Outcomes</b>	
<p>Farmers are diagnosing when soil function is sub-optimal and is impacting yield and productivity.</p> <p>Farmers have cost-effective options to ameliorate soil-based constraints (e.g. compaction) in</p>	<p><b>Farmers are using simple and reliable tools to identify soil problems and what management is best to improve the plant root zone.</b></p> <p><b>Farmers have cost effective options for</b></p>

<p>locations where plant production is below the intrinsic potential.</p> <p>The condition (health) and productivity of managed soils is improved using practical, well-verified, system-based strategies incorporating biological, chemical and physical process understanding.</p> <p>Rates of soil loss are reduced as a result of improved soil condition, greater levels of plant cover, and appropriate land use.</p>	<p><b>improving production through specific soil management actions.</b></p> <p><b>The health and productivity of farmed soil is improved using practical, reliable and proven technology.</b></p> <p><b>Soil loss is reduced as a result of improved soil condition, greater levels of plant cover, and appropriate land use.</b></p>
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## **Developing smart ways to manage water and nutrients to increase production while protecting the environment**

### **Actions**

<p>Find new ways to improve nutrient-use efficiency, especially of nitrogen and phosphorus, in managed landscapes (e.g. improved fertiliser management that addresses the amount, form, placement, timing and potential for bio-enhancement).</p> <p>Find new ways to optimize soil water-use in managed landscapes and improve the integrated management of water and nutrients in irrigation systems.</p> <p>Determine current rates of soil acidification and identify feasible remedies.</p> <p>Rebuild the stocks of organic carbon in Australian soils.</p> <p>Develop efficient strategies for reducing soil greenhouse gas (GHG) emissions.</p>	<p><b>Continue to find new ways to efficiently use fertilisers and soil additives, including looking at placement, amount, timing and forms of fertiliser and additives used.</b></p> <p><b>Develop ways to manage the soil to allow water to be used more efficiently on farms.</b></p> <p><b>Determine current rates of soil acidification and identify feasible remedies.</b></p> <p><b>Rebuild organic matter in Australian soils.</b></p> <p><b>Develop efficient strategies for reducing greenhouse gas emissions from farmed soils.</b></p>
<b>Outcome</b>	
<p>Increased total factor productivity in crop, irrigated, pasture and livestock industries.</p> <p>Reduction in agricultural nutrients entering the environment.</p> <p>Greater ability of agricultural industries to adapt to variable and reduced rainfall and water availability.</p> <p>Soil acidification is ameliorated, avoiding environmental impacts and widespread loss of agricultural productivity.</p> <p>Increased carbon is stored in agricultural soils resulting in improved soil structure and plant productivity as well as significant carbon offsets.</p> <p>Landholders are implementing efficient strategies for reducing emissions of GHG from agriculture.</p>	<p><b>Greater farm productivity per hectare and reduced nutrient wastage on farms.</b></p> <p><b>More information and tools to help farmers and land managers adapt to changing rainfall and water availability.</b></p> <p><b>More knowledge of the scale and management of soil acidification, before it impacts on farm productivity.</b></p> <p><b>Improved management practices leading to more organic matter in agricultural soils, greater plant growth and carbon offsets.</b></p> <p><b>Tools for reducing greenhouse gas emissions from agriculture are readily available and understood</b></p>

## Improving the ways that soil information is shared and used

Actions	
<p>Deliver easy-to-use spatial soil information at the scale of the farm and small catchment that enables farmers to benefit from precision, zone and mosaic management approaches.</p> <p>Design practical and effective methods for monitoring soil function to underpin local management of water, nutrients, and carbon, and prevent degradation processes such as compaction, acidification, salinization, and erosion.</p> <p>Apply new technologies for forecasting soil condition with an emphasis on functional attributes related to land management and plant productivity.</p> <p>Support the development of Australia's soil-data infrastructure (including computing, laboratory and archiving facilities) and provide web-based delivery of information services that unlock step changes in productivity through sustainable soil management.</p>	<p><b>Publish soil maps at a scale that allows farmers to use them for precision farming.</b></p> <p><b>Develop methods for measuring and monitoring soil functions to improve management and to reduce degradation.</b></p> <p>???</p> <p><b>Build an IT infrastructure that supports the delivery of web-based soil data and information.</b></p>
Outcomes	
<p>Effective knowledge exchange and improved soil management.</p> <p>Reduced risks and uncertainties for farmers in deciding between alternative management strategies with the aim of achieving greater agricultural productivity.</p> <p>Better matching of land use to land capability particularly in areas of new agricultural development.</p> <p>An ability to monitor and forecast changes in soil condition under current and future systems of land management from local through to national scales.</p> <p>The 'Big Data' revolution improves soil management and provides direct benefits to farmers and land managers.</p>	<p><b>Farmers know how to improve their soil management.</b></p> <p><b>Risk and uncertainty of soil management activities is reduced.</b></p> <p><b>Land use is matched to land capability.</b></p> <p><b>We can better report on soil condition at a range of scales.</b></p> <p><b>The Big Data revolution improves soil management and provides benefits to farmers and land managers.</b></p>

## Identifying and promoting new and innovative ideas in good soil management

Actions	
<p>Develop more effective ways to engage and exchange knowledge with farmers and land managers so that soil related R&amp;D is applied and the potential benefits realised.</p> <p>Capture the learnings from farmers and land managers as they test thousands of ideas every year in their day-to-day operations.</p> <p>Test and verify the innovations using sound</p>	<p><b>Develop more effective ways for farmers to access soil knowledge so that the benefit of research is realised.</b></p> <p><b>Capture the learnings from farmers and land managers as they test thousands of ideas every year in their day-to-day operations.</b></p> <p><b>Scientifically validate new ideas to see where</b></p>

<p>science to understand the likely effectiveness in different industries, locations and soil types.</p> <p>Communicate innovations in soil management and work with farmers and land managers within a co-learning paradigm to maximise adoption of useful new technologies and practices.</p>	<p><b>else they might work.</b></p> <p><b>Publicise and promote farmer innovations in soil management to maximise adoption elsewhere.</b></p>
<p><b>Outcomes</b></p>	
<p>Reduced risk and uncertainty for land managers as to the likely effectiveness on their farm of practices designed to improve and maintain soil function.</p> <p>New soil management ideas and innovations being evaluated, shared and applied more widely.</p> <p>Increased public recognition of the fundamental linkage between the soil and agricultural productivity, and between soil and major environmental challenges (e.g. climate change).</p>	<p><b>Farmers will be able to introduce new soil management practices with greater certainty that they will work.</b></p> <p><b>New soil management ideas are tested, shared and applied more widely.</b></p> <p><b>Increased public recognition of the contribution of soil management to the food they eat and the threat that environmental challenges might pose.</b></p>

#### **Ensuring that soil and land use policy is focussed and relevant**

<p><b>Actions</b></p>	
<p>Support policy and planning with credible science to effectively identify and protect good quality agricultural land (e.g. better management of trade-offs with urban expansion, mining and energy developments, forestry and biodiversity).</p> <p>Develop complementary policies in the national interest that address climate, agricultural and environmental objectives.</p> <p>Support education policies and programs that lead to a better understanding of soils and the ecosystem services they provide in rural and urban communities.</p> <p>Find policy solutions that address market failure in relation to the collection, management and provision of soil information.</p> <p>Develop adaptive management frameworks that enable soils information and knowledge to be better utilised in land planning, policy implementation and industry growth.</p>	<p><b>Support policy and planning with good science to effectively identify and protect good quality agricultural land..</b></p> <p><b>Develop complementary policies in the national interest that address climate, agricultural and environmental objectives.</b></p> <p><b>Support education policies and programs that lead to a better understanding of soil and the benefits that they provide in rural <u>and</u> urban communities.</b></p> <p><b>Agree on a model to fund and deliver the collection, management and provision of soil information.</b></p> <p><b>Ensure that soil information and knowledge is better utilised in land planning, policy implementation and industry growth.</b></p>
<p><b>Outcomes</b></p>	
<p>More efficient and equitable use of Australia's soil and land resources.</p> <p>Reduced conflict over land use and management and the impact of agriculture (e.g. on water quality).</p> <p>Actions to prevent and reduce the risks of long term soil and land degradation.</p>	<p><b>More efficient and equitable use of Australia's soil and land resources</b></p> <p><b>Reduced conflict over land use management and the impact of agriculture.</b></p> <p><b>A reduction in the risks of long term soil and land degradation.</b></p>

<p>Lessening of the urban-rural divide in Australia with citizens having a better understanding of agricultural production systems.</p> <p>Creation of a sustainable business model for soil data collection and management that recognizes that soils are both a public and private good.</p>	<p><b>Greater understanding by all Australians of agricultural production systems.</b></p> <p><b>A business model for soil data collection and management that recognises that soils delivers both public and private benefits.</b></p>
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# Attachment Two: Proposal for a 'Register of long term soil related research sites in Australia'

## Background

In 2011 the expenditure on Soils related RD&E was estimated to be \$124M (DAFF 2011). The Soils RD&E Strategy (hereafter referred to simply as '*the strategy*') identifies a number of priority activities to improve the effectiveness and outcomes from Soils RD&E in Australia. One of the goals of the strategy is to improve use of physical infrastructure, which includes long term trial sites. The strategy notes that 'these (*long term trial sites*) are essential to enable assessment and comparison of gradual changes in soil attributes under different farming systems, for evaluation of the effects of climate change and of alternative adaptation strategies and for testing of innovations in soil management at practical spatial and temporal scales'.

Whilst short term trials are often satisfactory for examining factors that impact quickly upon agronomic or ecosystem functioning (such as inorganic fertiliser input effects on crop yield), in other cases long term trials are required to assess longer term agronomic and ecological impacts. For example factors such as pH, soil carbon and microbial communities may take much longer to respond to treatments. Long term trials are also important for examining effects of climate change, systems impacts and validation of models.

The Soils RD&E Strategy notes that 'A trend to undertake short- to mid-term soil RD&E studies on private properties is expected to increase. The best use of field stations for soil research will likely shift towards long-term studies on valued ecosystems (or cropping systems), supported by quality-assured measurements and detailed records, together with assured long-term staffing and funding'.

The Soils RD&E strategy recommended that 'a network (*for sharing information about and interrogating existing long-term experiments*) should be developed, with consideration given to how experiments can be accessed by collaborators to address scientific questions'.

This proposed project (the register) will assist in addressing this recommendation and has been endorsed as a priority by the Soils RD&E Strategy Implementation Committee. Developing a register may allow researchers to identify existing sites, samples and data sets that can be used to investigate new issues and problems without the cost of having to establish new trial sites and will also provide long term data sets. This may also help foster further collaboration amongst researchers.

## Purpose

Develop a readily accessible and updatable database of long term soil related trial sites that can allow stakeholders and researchers to determine if there are existing trial sites and historical samples and records that may be used to investigate particular soils related issues without having to establish new and/or long term research sites. This will increase the efficiency of research and allow research questions to be examined using long term trial sites.

## Benefits of a long term trial sites register

- Potential access to pre-existing trials and data sets for relatively little cost

- Ability to analyse treatment effects over longer time frames than possible with traditional 3-5 year research trials
- Greater return on investment from limited RD&E funding
- Ability to value and prioritise long term trial sites for on-going resourcing
- Improved collaboration between researchers
- A step towards a National network and system of long term research and monitoring sites

## What constitutes a long-term trial site

In Australia the majority of research trials have traditionally been funded for 3 years which means that the vast majority of trials are abandoned after this period. However there are numerous trial sites that have been run for longer periods and some that have been run for long periods of time of 30-50 years. What constitutes a long term trial site in some respects depends on the issue being examined. Rasmussen *et al.* (1998) defined long term trial sites as greater than 20 years whilst others have used shorter timeframes, e.g. 10 years (Martin *et al.* 1998) or alternative more general criteria such as '.....plan to run for long enough to cause measurable change in some indicators of the status of the crop-soil resource base' (Martin *et al.* 1998). Specifying particular criteria may preclude entry of valuable medium term trial sites. It is recommended that generally any trial that has had active management for a period of 10 years or greater be classified as a long term trial site. Those people examining the database can then make their own judgements as to the relevance of the trial in light of the length of its operation.

## Information to be collected

There is a large amount of information that could be collected but the primary purpose of the register is to simply allow interested parties to determine what long-term trials are available and their characteristics and key treatments and provide a contact where further information can be sourced. Keeping the data requirements for the register to a useful minimum will maximise the chances of getting as many entries as possible.

## Process of data collection

Survey monkey will be used to circulate the survey and then collate the data by importing into an excel spreadsheet?

Awareness of survey will be raised by Soil Crumbs, the Soils RD&E IC members representing their agencies and institutions and by emailing a link to the survey to a list of key stakeholders in private sector, universities and the government. (Can we use mailing lists from the participants involved in the workshops leading to the development of the strategy?)

## Where and how is data stored?

It is intended that the Soils RD&E Strategy will have a website hosted by ?. This website would seem to be the ideal place to locate the database in the first instance. There is also certain key soils related information registers already in existence most notably the ASRIS system maintained by CSIRO. Ensuring links to the database are located on key websites such as the ASRIS site would seem an attractive option.

## Accessing the long-term trial site register

The register won't be a true database but rather be housed in an excel document (?). The on-line data will be a copy of the dataset with the original being retained by ??? Wouldn't be a live database but simply a downloadable version? If it were as an excel version users could sort/filter as they choose.

## Timelines for development of the long-term site register

- On-line survey released in Feb 2016 and kept open for a month with active follow ups of key contacts
- Draft report/register by the May 2016 Soils RD&E Implementation Committee meeting
- Finalise version one of register by August 2016
- 

## Appendix 1: Proposed data fields and options

Location (postcode, town, state)

Co-ordinates (S and E)

Land tenure – (private, local, state or federal government)

Organisation/individual responsible (name)

Contact person (name)

Contact details (address, phone, email)

Soil type (Free text - Australian classification)

Soil type (Free text - International classifications)

Mean rainfall (mm)

Mean annual temperature (oC)

Land use type (cropping, pasture, horticulture, forestry, native vegetation, other)

Plant species (free text? Or default list)

Site establishment date (mm/yy)

Is site still current/actively being managed? (y/n)

General trial treatment objectives (free text)

Treatments (free text)

Replicated – (yes/no)

No. of replicates (na, number)

Duration of treatment maintenance (years)

Archived historical samples (yes/no)

Details of archived samples (free text)

Stakeholders/funders

IP issues (yes/no)

Details of IP issues (na or free text)

Reference documents (free text - websites, reports etc.)

Journal publications (free text - list)

Soil RD&E Implementation Committee	Meeting Number: 4
	Location: Sydney
	Date: 26 <sup>th</sup> November 2015
AGENDA Paper	ITEM 4.10

## Update on the Soil Sensing project

### Background

In June 2015, Agriculture Minister, Barnaby Joyce, announced \$1.5 million in funding for a CSIRO project to provide farmers with practical information and advice on ways to use soil to reduce input costs and improve production in their cropping paddocks and pastures. The project is being led by Ross Searle (CSIRO, Brisbane) and its title is *Soil sensing - new technology for tracking soil water and nitrogen availability, managing risk and improving management decisions*.

The objective of the project is to produce an online system that supplies dynamic information on farm-scale soil-water and nutrient status. The project will:

- estimate current and predict future soil moisture stores at the field scale using satellite and field-based measurement systems,
- investigate the use of local automated and telemetered climate data stations to improve farmer's knowledge of seasonal conditions in their paddocks,
- quantify and track the nitrogen stocks in the soil to optimise use of fertiliser inputs, and
- assess the viability of a number of communications technologies to assist in the collection and synthesis of relevant data streams.

A suite of digital tools will be used to synthesise the information collected at the field scale to provide comprehensive insights into crop dynamics which will assist farmers in their management decisions. Information streams generated in the project will be made available via readily accessible web services. Interpreted analysis of this data will be delivered to users via modern web and mobile platforms.

### Key issues

A planning workshop for the project was held in Brisbane on the 4<sup>th</sup> and 5<sup>th</sup> of November and the 30 participants included researchers and stakeholders with interests in the field. Synergies with existing projects and activities were identified and they included:

- GRDC funded projects on estimation of plant available water and soil properties (USQ, University of Sydney)
- The Australian Soil and Landscape Grid
- Projects on time-series remote sensing of the water balance and field measurement networks (e.g. CSIRO, University of Melbourne)
- Activities relating to the measurement and modelling of the nitrogen cycle in farming systems
- Simulation modelling of farming systems (e.g. APSIM)
- Delivery of web services and the development of new advisory systems for farmers (e.g. Birchip Cropping Group, CSIRO Land and Water)

- New work on weather forecasting and seasonal outlooks (Bureau of Meteorology)

The project has research, development and extension components. It is highly collaborative and the style of engagement fits with the broad intent of the Soil RD&E strategy. Members are encouraged to monitor the project and provide input and support where possible.

**Required action**

For information

**Resource implications**

None at this stage

**Preparation and consultation**

Soil RD&E Secretariat

**Attachments**

Soil RD&E Implementation Committee	Meeting Number: 4
	Location: Sydney
	Date: 26 <sup>th</sup> November 2015
AGENDA Paper	ITEM 4.11

### Budget update

The strategy requires an operating budget of approximately \$150,000 a year. Funding was initially sought from members of the implementation committee. Table 1 provides a summary of the initial cash contributions. The following tables provide an update to the initial budget which was tabled at Meeting Two. Table 2 is an updated report on expenditure for 2014/15. A summary of cash contributions received to date for 2015/16 is provided in Table 3. Expenditure to date for 2015/16 is shown in Table 4. The proposed but incomplete budget for 2015/16 is presented in Table 5 – activities such as meetings for subcommittees are yet to be finalized.

Table 1: Cash contributions for 2014-15 paid by member agencies

Organisation	Cash contribution
Department of Agriculture	15,000
NT DLRM	5,000
DAFWA	15,000
GRDC	35,000
Dairy Australia	15,000
MLA	10,000
GWRDC	10,000
SRA	15,000
CRDC	15,000
CSIRO	20,000
UNE	9,092
Rollover from strategy development budget	<b>\$35,616</b>
Total funds available*	<b>\$239,708</b>

\* Includes forward payment of \$40 000 from CSIRO (\$20 000 p.a. for years 2 and 3).

\*\* The initial rollover amount received by CSIRO from DoA was \$224,708; the DoA 2014/15 contribution of \$15,000 was paid later to CSIRO as a separate transaction.

Table 2: Report on expenditure (as at 30/06/2015)

Item	Expenditure (\$)
Domestic travel fares and expenses	2,179
General operating (meeting catering and room hire)	1,231
<b>Subtotal</b>	<b>3,410</b>
Salary liability (executive officer (0.4FTE) 23 February to 30 June 2015)	20,769
<b>Remaining funds balance</b>	<b>\$215,529</b>

Table 3: Cash contributions received for 2015-16 by member agencies (NB: CSIRO contributions of 20,000 for 2015-16 were prepaid in 2014-15; the Department of Agriculture has committed \$15,000 for 2015-16).

Organisation	Cash contribution (\$)
GRDC	35,000
Dairy Australia	15,000
MLA	10,000
SRA	15,000
CRDC	15,000
RIRDC	15,000
Carry forward from 2014-15	215,529
<b>Total funds available</b>	<b>\$320,529</b>

Table 4: Report on expenditure (2015-2016 year, as at 31/10/2015)

Item	Expenditure (\$)
Domestic travel fares and expenses	471
Salary liability (executive officer) (0.4FTE; 1 July to 31 October 2015)	20,769
Operating (meeting catering, website domain costs)	461
<b>Subtotal</b>	<b>21,701</b>
<b>Remaining funds balance</b>	<b>\$298,828</b>

Table 5: Proposed budget 2015/16 (incomplete)

<b>Activity</b>	<b>Cost (\$)</b>
Executive Officer (full year)	60,000
Publications metrics/ updating capacity audit	TBC
Annual forum/workshop	20,000
Outlook 2016 (TBC)	9,000
Meeting costs (committee and executive)	5,000
Reprint of strategy	1,500
Website development	2,100
ASAP implementation	TBC
<b>Total</b>	<b>97,600</b>

### **Key issues**

- There is a significant surplus of funds available in comparison with the currently proposed budget for 2015/2016.
- Significant activities for 2015/2016 are yet to be finalized (e.g. subcommittee activities).
- Resourcing plans need to be further developed.

### **Required action**

- Note the current budget and expenditure.
- Activities (e.g. subcommittee meetings) need to be finalized as soon as possible to enable finalization of the 2015/16 budget.

### **Resource implications**

- As shown above

### **Preparation and consultation**

- Secretariat and members.

### **Attachments**

- None

Soil RD&E Implementation Committee	Meeting Number: 4
	Location: Sydney
	Date: 26 <sup>th</sup> November 2015
AGENDA Paper	ITEM 4.12
<b>2016 meeting dates</b>	
<p><b>Background</b></p> <p>At the first meeting of the Soil RD&amp;E Implementation Committee in February 2015 the committee agreed to meet on a quarterly basis. Suggested dates and locations for meetings in 2016 are:</p> <ul style="list-style-type: none"> <li>• 3rd and 4th February- meeting combined with the annual forum (Melbourne)</li> <li>• 25 May (Canberra)</li> <li>• 25 August (Brisbane)</li> <li>• 24 November (Sydney)</li> </ul>	
<p><b>Key issues</b></p> <p>Consider whether the dates and locations suit the majority of people on the committee.</p>	
<p><b>Required action</b></p> <p>For discussion and noting</p>	
<p><b>Resource implications</b></p> <p>Travel and accommodation will need to be covered by each member's organisation. Associated meeting costs will be covered by the committee's budget.</p>	
<p><b>Preparation and consultation</b></p> <p>Secretariat and Executive Committee</p>	
<p><b>Attachments</b></p> <p>None</p>	