

NRM on farms



A monthly news summary about climate and natural resources in agriculture.

November 2014

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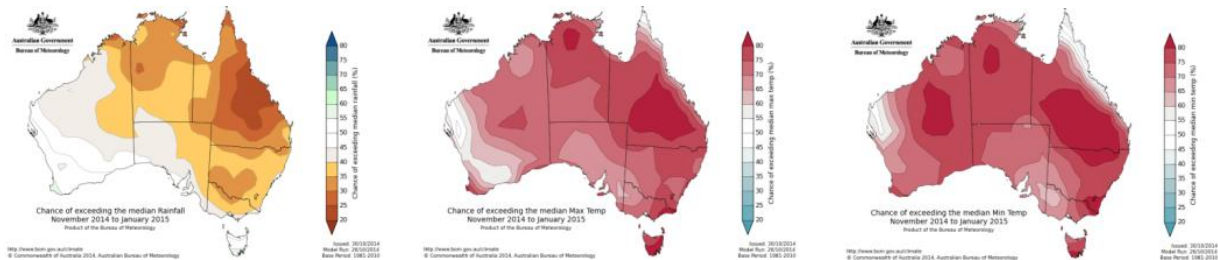
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CLIMATE

Seasonal outlook



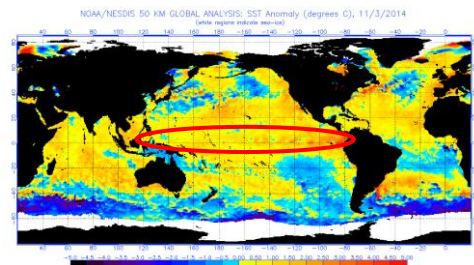
A drier than normal November to January is likely for NSW (above left), along with warmer than normal temperatures day (above centre) and night (above right). Climate influences include warmer than normal temperatures in the tropical Pacific, near normal tropical Indian Ocean temperatures, and normal to cooler sea surface temperatures north of Australia.

<http://www.bom.gov.au/climate/ahead/>

Ocean temperatures

Positive anomalies are present along the equatorial Pacific, most of the Indian Ocean and most of the northern Pacific Basin. Warmer central Pacific waters late in the year typically result in warmer and drier weather for eastern Australia, and increased bushfire risk in the south.

<http://www.ospo.noaa.gov/Products/ocean/sst/anomaly/index.html>



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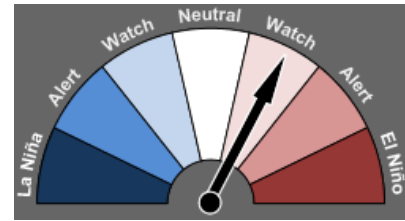


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El Niño remains neutral

Overall, the El Niño–Southern Oscillation (ENSO) remains neutral. Sea surface temperatures in the tropical Pacific Ocean have warmed over the past two months, and the Southern Oscillation Index has remained negative, but indicators generally remain in the neutral range. The existence of warmer-than-average water in the tropical Pacific sub-surface supports a continuation of the current near-El Niño conditions.

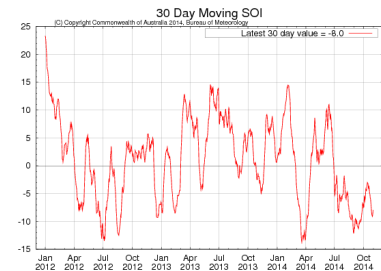
<http://www.bom.gov.au/climate/enso/>



SOI

The latest approximate 30-day SOI value to 3 November is -9.3 . Sustained negative values below -8 may indicate an El Niño event.

<http://www.bom.gov.au/climate/enso/#tabs=SOI>



Models say reduced chance of El Niño

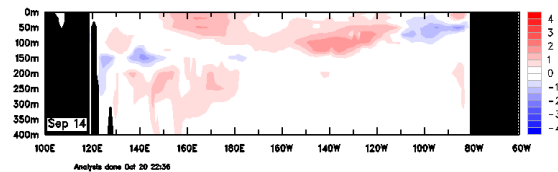
International climate models suggest that warmer-than-average tropical Pacific sea surface temperatures are likely to persist. Three of eight models reach El Niño thresholds in January 2015, and two remain just shy of thresholds. Australian rainfall and temperature patterns show some El Niño-like impacts, with the country generally warmer and drier than usual over recent months.

<http://www.bom.gov.au/climate/ahead/model-summary.shtml>

Pacific subsurface warming

September subsurface temperatures showed warm anomalies in the west and central Pacific.

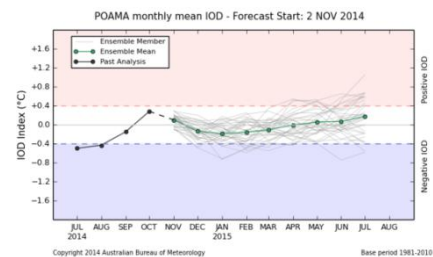
<http://www.bom.gov.au/climate/enso/>



IOD remains neutral

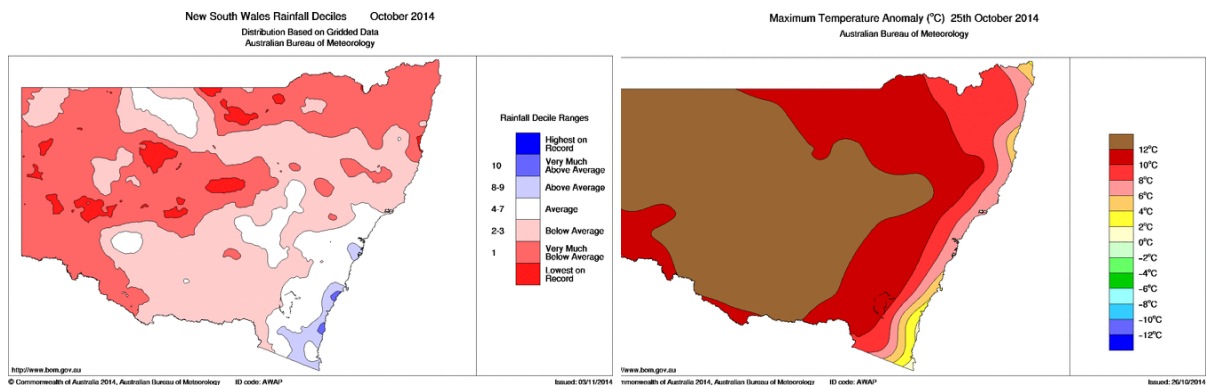
The Indian Ocean Dipole (IOD) index is within neutral bounds and climate models favour a continuation of neutral IOD values for the remainder of the year. A positive IOD SST pattern is associated with a decrease in rainfall over parts of central and southern Australia.

<http://www.bom.gov.au/climate/enso/#tabs=Indian-Ocean>



Record October temperatures for NSW

NSW recorded its warmest October on record with the mean temperature 2.56°C above the long-term average. Day time temperatures were also the warmest on record for October at 4.0°C above the long-term mean. Many stations including Wilcannia, Inverell, Hay, Scone and Griffith, recorded their warmest October temperature on record as well as breaking records for daily temperatures and numbers of days above 35°C . October rainfall was 66% below the long-term average.



Above left: Rainfall deciles for October 2014.

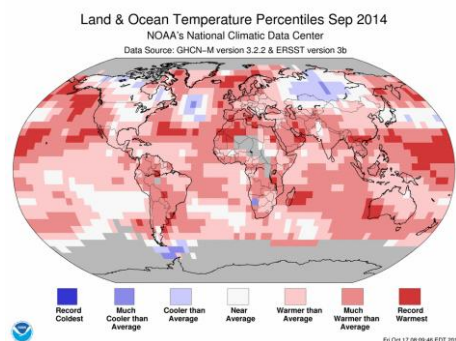
Above right: Daytime temperature anomalies on 25 October.

<http://www.bom.gov.au/climate/current/month/nsw/summary.shtml>

Warmest September on global record

The combined average temperature over global land and ocean surfaces for September 2014 was the highest on record for September, 0.72°C above the 20th century average of 15.0°C. The global land surface temperature was 0.89°C above the 20th century average of 12.0°C, the sixth highest for September on record. For the ocean, the September global sea surface temperature was 0.66°C above the 20th century average of 16.2°C, the highest on record for September and also the highest on record for any month.

<http://www.ncdc.noaa.gov/sotc/global/2014/9>



NSW DPI seasonal conditions report

Subscribe to NSW DPI's seasonal conditions report, and the climate summary which provides a snapshot of the monthly report in an easy to read four-page format with additional graphs and charts.

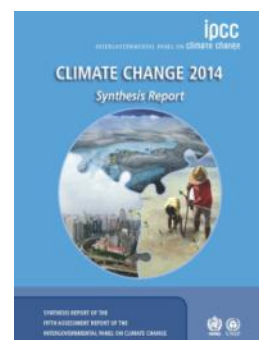
<http://www.dpi.nsw.gov.au/agriculture/emergency/seasonal-conditions/regional-seasonal-conditions-reports>

CLIMATE RESOURCES

IPCC: Warming of the climate is unequivocal

The IPCC's AR5 synthesis report, released on 1 November, concludes that warming of the climate system is unequivocal and many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen. The most cost-effective mitigation options in agriculture are management of cropland and grazing land, and restoration of organic soils.

<http://www.ipcc.ch/>



IPCC climate change implications for agriculture

This briefing from the University of Cambridge explores the specific climate change trends that will affect the agricultural sector. The effects of climate change on crop and food production are already evident in several regions of the world, with negative impacts of climate trends more common than positive ones.

<http://www.cisl.cam.ac.uk/Resources/Climate-and-Energy/Climate-Change-Implications-for-Agriculture.aspx>

MOJO joins the climate dog team

The Climate Dog animations have been joined by MOJO to explain the Madden-Julian Oscillation, an eastward moving pulse of cloud and rainfall near the equator that typically recurs every 30 to 60 days. It influences the timing, development and strength of the major global monsoon patterns, including the Indian and Australian monsoons and can affect southern rainfall.

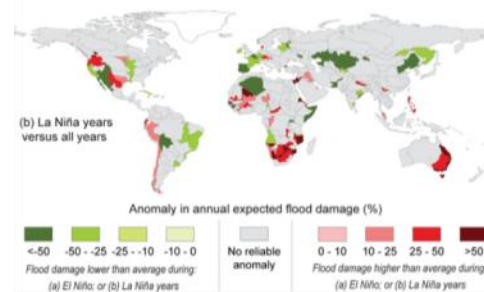
<http://www.dpi.nsw.gov.au/agriculture/resources/climate-and-weather/variability/climatedogs>



Flood hazard in La Nina years

A new study comparing flooding in El Niño and La Niña years to the 1958-2000 average found that parts of Australia see flood risk increase by more than 50 per cent in La Niña years. Globally, the worst-affected regions are Australia, western Africa, the Sahel, western US, and parts of South America and southern Africa.

<http://www.pnas.org/content/early/2014/10/16/1409822111>



Oceans warming faster than expected

The upper layers of the world's oceans have been warming much faster than realised over the past few decades due to sparse sampling of the Southern Hemisphere's oceans. New research suggests that the amount of heat energy entering the upper 700 metres of these oceans has been underestimated by anything from 48% to 152%. Because the Southern Hemisphere contains 60% of the world's ocean, this means that as a global average, the oceans have been heating between 24% and 58% faster than previously thought.

<http://theconversation.com/southern-oceans-heating-up-faster-than-scientists-realised-32627>

Climate change and bushfire threat

This report from the Climate Council emphasises that climate change has created a hotter Australia, and is already influencing all types of extreme weather events, including the risk of bushfires in NSW. Another report from Deloitte Access Economics projects that the total economic costs of NSW bushfires in 2014 will be A\$43 million (in 2011 dollars) and by the middle of the century these costs are set to almost triple based on population and assets alone.

<https://www.climatecouncil.org.au/be-prepared-climate-change-and-the-nsw-bushfire-threat>

<http://www.ausfpa.com.au/wp-content/uploads/AFPA-DAE-report-Amended-Final-2014-05-27.pdf>



SA MDB climate change adaptation plan

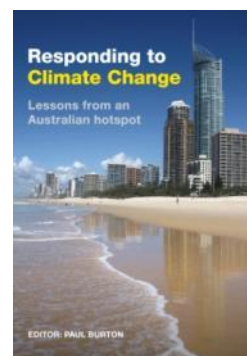
A climate change adaptation plan for the SA Murray-Darling Basin region identifies eight key areas for adaptation – the Coorong and Lower Lakes, vulnerable members of the community, irrigation, dryland farming, emergency services, pest animals and plants and essential services. It identifies priority actions for each area. The plan is one of 12 that will be finalised for each of South Australia's geographical regions by 2016.

<http://www.naturalresources.sa.gov.au/samurraydarlingbasin/projects/all-projects-map/adapting-to-climate-change>

Lessons from a climate change hotspot

This book brings together research from the Griffith Climate Change Response Program, showing how best to respond to anticipated changes in south-east Queensland and how to overcome barriers to adaptation. The authors treat climate change adaptation as a cross-cutting, multi-level governance policy challenge extending across human settlements, infrastructure, ecosystems, water management, primary industries, emergency management and human health.

<http://www.publish.csiro.au/pid/7014.htm>



Approaches to climate change risk management policy

A new policy study from the American Meteorological Society examines four approaches to climate change risk management: reducing greenhouse gas emissions, increasing society's capacity to cope with changes in climate, deliberate manipulation of the earth system; and learning and understanding more about the climate system.

http://www2.ametsoc.org/ams/assets/File/Climate_Policy_Study_final.pdf

NSW Adaptation Research Hub newsletter

The Office of Environment and Heritage produces a newsletter on the work of its Adaptation Research Hub. You can subscribe to the newsletter at the link below.

heather.stevens@environment.nsw.gov.au

NCCARF 2014 conference abstracts

Abstracts and presentations from the 2014 NCCARF adaptation conference are available online.

<http://www.nccarf.edu.au/conference2014/>

Climate change science and negotiations online course

The UN Sustainable Development Solutions Network is offering this free online course which is structured around pre-recorded lectures, readings, quizzes and discussion forums. Each of the course components can be completed at a time convenient for the student, and most activities are given a two-week window for completion. The material for each week is made available each Thursday, and once the material has been opened, it remains open for the duration of the course. There are no written assignments for this course.

<https://www.sdsnedu.org/learn/climate-change-science-and-negotiations-october-2014>

Heat wave index

European scientists have developed a Heat Wave Magnitude Index that incorporates daily maximum temperatures and their duration. The index classifies the 2010 Russian heatwave that killed 55,000 people as an extreme event, earning a median score of 5.43 compared with 3.48 for the 2003 European heatwave, which may have killed more than 70,000 people. UNSW climate scientist Sarah Perkins says the index is useful, but could be improved by including daily minimum temperatures.

<http://www.nature.com/news/russian-summer-tops-universal-heatwave-index-1.16250>

UK Farming Futures fact sheets

This series of fact sheets is designed to help farmers prepare for the impacts of climate change and find opportunities for their businesses.

<http://www.farmingfutures.org.uk/resources/factsheets>

EMISSIONS

Senate passes Emissions Reduction Fund legislation

The Senate passed the Carbon Farming Initiative Amendment Bill 2014 on 31 October 2014. The Bill will take effect once passed by the House as amended. This will establish the Emissions Reduction Fund.

<http://www.environment.gov.au/climate-change/emissions-reduction-fund>

Transitioning from CFI to Emissions Reduction Fund

If you are running a Carbon Farming Initiative project, have applied to run a project or are thinking about a project using a CFI method, it is important to understand what you need to know as the CFI moves to the Emissions Reduction Fund.

<http://www.cleanenergyregulator.gov.au/Emissions-Reduction-Fund/Pages/default.aspx>

New CFI methodologies

Methodologies for farm forestry measurement method and reforestation are now available.

<http://www.cleanenergyregulator.gov.au/Carbon-Farming-Initiative/methodology-determinations/Pages/default.aspx>

Enteric methane research summary

Enteric methane is produced by ruminant animals including cattle and sheep and is responsible for 10% of Australia's greenhouse gas emissions. This new booklet from NSW DPI explains what it is, why it's a problem and the current research effort to reduce enteric methane emitted by livestock.

http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0011/532694/agriculture-resources-climate-enteric-methane.pdf

Climate change, carbon and wildfires

A growing body of evidence suggests that carbon produced by wildfires is contributing to volume of GHG in the atmosphere. This report from Future Directions suggests that atmospheric carbon estimates should include wildfires as a significant GHG source and effort to reduce atmospheric carbon must include measures to curb wildfires.

http://www.futuredirections.org.au/files/sap/FDI_Strategic_Analysis_Paper_-_Climate_Change_Carbon_and_Wildfires.pdf

Outlook for nitrous oxide emissions

Nitrous oxide emissions are the third most important anthropogenic greenhouse gas and the largest remaining anthropogenic source of stratospheric ozone depleting substances. Gross anthropogenic emissions by sector are 66% from agriculture, 15% from energy and transport sectors, 11% from biomass burning, and 8% from other sources. This paper updates estimates for current anthropogenic and natural N₂O emissions and for emissions scenarios to 2050.

<http://iopscience.iop.org/1748-9326/9/10/105012/>

WATER

Green paper identifies potential water projects

The Agricultural Competitiveness Green Paper released last month includes a list of possible water infrastructure projects identified by a ministerial working group which looked at how investment in water infrastructure, such as dams and groundwater storage, could be accelerated.

https://agriculturalcompetitiveness.dpmc.gov.au/sites/default/files/green_paper.pdf



Australian Groundwater Explorer

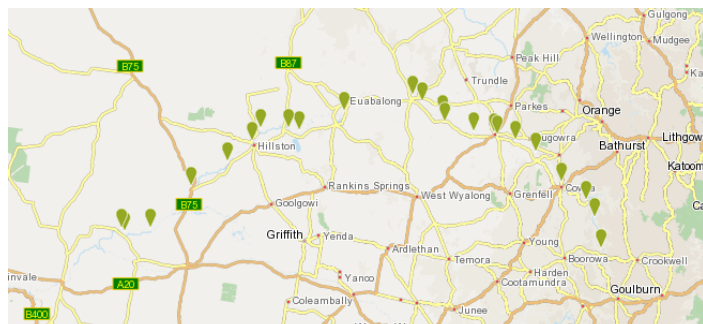
The Bureau of Meteorology's new Australian Groundwater Explorer provides a comprehensive picture of Australia's groundwater resources, with bore and bore-log information for over 800,000 sites.

www.bom.gov.au/water/groundwater/explorer/

Water Data Online

The Bureau of Meteorology has released a new service, Water Data Online, to provide a single access point to nationally consistent, timely data from thousands of water monitoring stations across Australia. You can now find standardised watercourse level and watercourse discharge data from approximately 3500 water monitoring stations around Australia. Over time, more stations and parameters will become available.

<http://www.bom.gov.au/waterdata/>



Water data monitoring points along the Lachlan River.

Geofabric helps understand water flows

The Bureau of Meteorology is using the Geofabric GIS system to understand the relationships between rivers, water bodies, aquifers and monitoring points. A video explaining how the system works is available online.

<http://www.bom.gov.au/water/geofabric/>

Measuring food's water footprint

In this Ecos article scientist Brad Ridoutt who helped develop a new international standard on water footprinting explains the use of life cycle assessment (LCA) to assess the complex connections between greenhouse gas emissions and water use in food manufacturing and agriculture.

<http://www.ecosmagazine.com/paper/EC14232.htm>

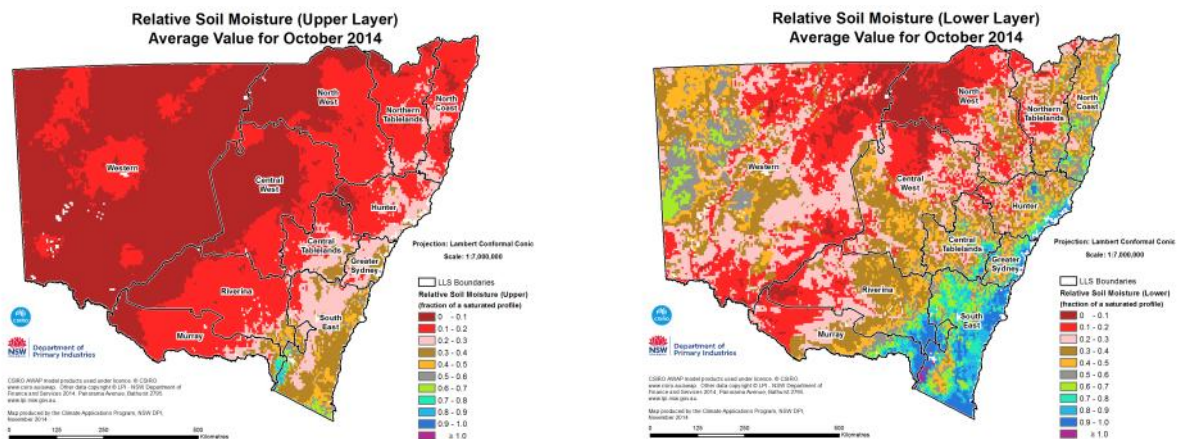
2014 water sector survey

Climate change was identified as posing a significant or moderate risk to the sustainable management of water by 86% of respondents in the 2014 Australian water sector survey. However, NSW respondents were divided about how well the state is responding to the impacts of climate change, and 67% believed the water sector should focus on ensuring systems can withstand extreme weather/events (eg fire or flood) to best address the impacts related to climate change.

http://www.awa.asn.au/State_of_the_Water_Sector_Survey/

SOILS

Soil moisture in October



NSW soils are drying out, with little moisture in the topsoil (above left) or the subsoil (above right) except for the south-east corner and far west.

http://www.csiro.au/awap/cgi/awap2.pl?ser=Australia_ops26j_monthly

Woody debris improves soil moisture

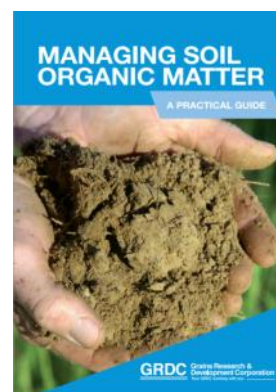
An ACT study has found returning coarse woody debris to paddocks can significantly reduce surface-soil moisture loss in water-limited ecosystems during dry periods and may also increase biological productivity, and reduce surface soil compaction.

http://www.publish.csiro.au/index.cfm?act=view_file&file_id=SR13337.pdf

Managing soil organic matter

This publication is a practical guide to understanding what soil organic matter is, why it's important and how you can manage it on-farm to increase soil functionality and enhance production benefits.

<http://www.grdc.com.au/GRDC-Guide-ManagingSoilOrganicMatter>



Soil organic matter overview

This GRDC update paper provides an excellent summary of the composition and functions of soil organic matter.

<http://www.grdc.com.au/Research-and-Development/GRDC-Update-Papers/2014/08/Soil-organic-matter>

A guide to fertilisers and soil treatments

This NSW assessment of alternative soil treatments for improving the biology and productivity of soils, pasture and livestock found that in phosphorus-limited soils the most cost effective treatments were those that provided adequate amounts of phosphorus. Microbial products, plant growth or microbial foods or less limiting major or trace elements did not increase pasture production.

<http://www.mla.com.au/Research-and-development/Final-report-details?projectid=15572>

Groundcover declines in south west NSW

DustWatch reports that in September the area around Ivanhoe in south western NSW saw substantial and widespread groundcover reductions in line with the below average rainfall recorded for June to September. Over the last 10 years the Ivanhoe plains had the highest groundcover in July / August. This year, the decline in groundcover is earlier with pasture use and breakdown outstripping pasture growth.

<http://www.environment.nsw.gov.au/resources/dustwatch/140781DWNL.pdf>

All the dirt newsletter

The latest quarterly edition of NSW DPI's 'All the dirt' soils newsletter is now out. To subscribe, email the link below.

allthedirt.newsletter@industry.nsw.gov.au

NSW soil knowledge network videos

This network of retired and semi-retired soil specialists has produced a range of short videos explaining different aspects of soils.

https://www.facebook.com/pages/NSW-Soil-Knowledge-Network/146935065480302?sk=timeline&ref=page_internal

European trial compares organic fertilisers

A long term European field trial comparing several types of organic fertilisers found that compost, farmyard manure and cattle slurry lead to minor differences in crop yield, farmyard manure increased phosphorus availability and leaching, and application of compost increased soil carbon levels without increasing phosphorus leaching risks.

<http://www.sciencedirect.com/science/article/pii/S016788091400379X>

Barriers to building onfarm soil carbon

Research into building onfarm soil carbon in Europe found that key barriers include perceived scientific uncertainty about the efficacy of practices, lack of real life 'examples to show farmers, difficulty in demonstrating the positive effects of soil carbon management practices and economic benefits over a long time scale, and advisors unable to provide suitable advice due to inadequate information or training. Most farmers are unconvinced of the economic benefits of practices for managing soil carbon.

<http://onlinelibrary.wiley.com/doi/10.1111/1746-692X.12057/abstract>

ENERGY

Prospects for renewable energy in NSW

This NSW Parliamentary briefing paper on policies and prospects for renewable energy in NSW includes a section on bioenergy and biomass. New South Wales had 37 bioenergy plants operating during 2013 and another five in development.

<http://www.parliament.nsw.gov.au/Prod/parlament/publications.nsf/0/C13156303757146ACA257D7A0019EE55>

BIODIVERSITY

History of NSW native vegetation regulation

This NSW Parliamentary report outlines the ways in which the clearing of native vegetation has been regulated in NSW from 1788 to the present. The focus of the paper is chiefly on the regulation of native vegetation clearing in rural areas, and includes a timeline of significant regulatory developments

<http://www.parliament.nsw.gov.au/Prod/parlament/publications.nsf/0/58FB54699A0BABDCCA257D7700023A8B>

Perennial plants in cropping systems

Crop & Pasture Science journal has produced a special issue about integrating perennial plants in cropping systems, based on findings the Future Farm Industries CRC's Evercrop research program. The research explored the potential offered by perennials in delivering commercial advantages and environmental benefits to their farming systems.

<http://www.publish.csiro.au/nid/40/issue/7236.htm>

Mixed plantings more productive than monocultures

A 10-year European study of yields from grassland plants cultivated in monocultures or mixed plant communities found the mixed plantings were more productive and increased their productivity over time. Mixed plantings occupy all the niches available in an ecosystem, so they use soil nutrients, light and water more effectively than monocultures.

http://www.mediadesk.uzh.ch/articles/2014/pflanzengemeinschaften-bringen-mehr-ertrag-als-monokulturen_en.html

FOOD

Junior Landcare encourages food growing

Landcare and the Primary industries Education Foundation have collaborated to produce resources to encourage schools to better understand where their food comes from and

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Primary Industries

participate in Landcare activities such as creating school gardens and building a closer connection with the land.

<http://www.juniorlandcare.com.au/curriculumresources>

SUSTAINABILITY

Rest and recovery build resilience to drought

These case studies of the McMurtrie family of Gilgunnia Station near Cobar and the Whyte family of Wyndham Station near Wentworth showcase the management principles and practices they are applying to build landscape and enterprise resilience to drought. Using a range of best-practice techniques, these graziers are improving ground cover and soil health and retaining more water in their soils. Their landscapes are regenerating and their enterprises becoming more sustainable, regardless of climatic conditions.

<http://www.soilsforlife.org.au/announcements/rest-recovery-of-pasture-the-key-to-resilience>

Drought feed calculator app

This app enables farmers to quickly calculate minimum feed requirements for a range of animals with different nutritional needs.

<http://www.dpi.nsw.gov.au/agriculture/emergency/drought/drought-feed-calculator-app>

MLA primary school guides

Meat and Livestock Australia (MLA) have released three new primary school guides on agricultural sustainability, covering farmer's roles, history of farming, and sustainable farming into the future.

<http://www.target100.com.au/Tips-resources/Sustainability-study-guides>



EVENTS

- | | |
|----------------|---|
| November 23-27 | National Soil Science conference, Melbourne
http://www.soilscience2014.com/ |
| November 24-25 | Food, planet and people, Agrifood conference, Sydney
http://sydney.edu.au/environment-institute/events/agrifood/ |
| November 27 | Water-energy-food nexus forum, Sydney
http://www.awa.asn.au/EventDetail.aspx?id=4294979573 |
| December 1-2 | Bioenergy Australia 2014
http://www.bioenergyaustralia.org/ |
| December 10 | International Perspectives on Biochar Research and Application, Sydney
http://www.conferenceonline.com/conference_invitation.cfm?id=20471&key=C70C0959-D5DB-4456-839F-8EB215CF5E18 |

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NRM on Farms is a monthly newsletter that summarises recent information about climate and natural resource management relevant to agriculture to keep farmers and agricultural and NRM advisors and researchers up to date. It is freely available to anyone interested or involved in agriculture or NRM. To subscribe, email Rebecca Lines-Kelly at rebecca.lines-kelly@dpi.nsw.gov.au.