

# NRM on farms



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

March 2015

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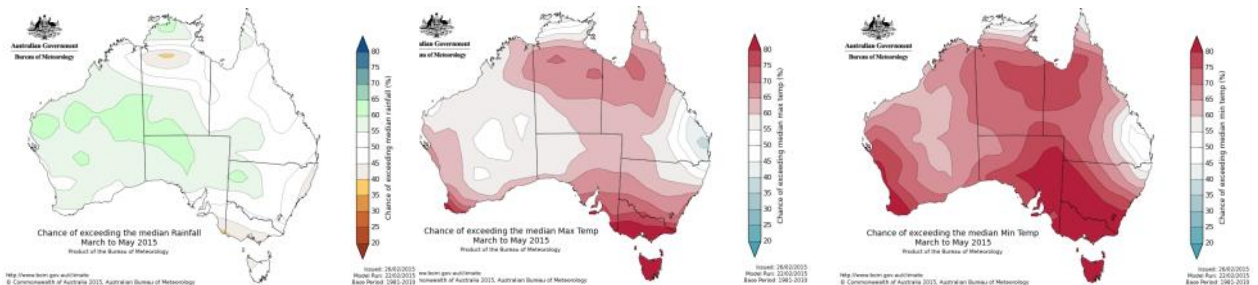
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## CLIMATE

### Seasonal outlook



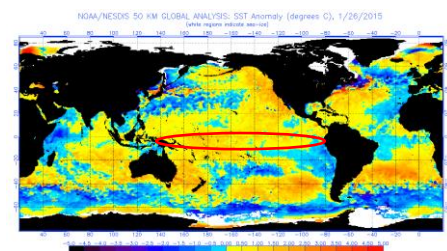
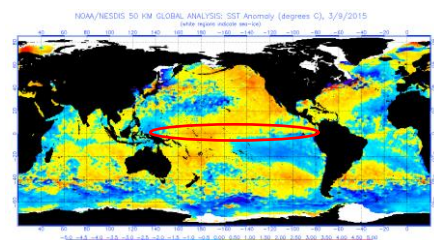
March to May has a roughly equal chance of being wetter or drier than normal (left) in NSW. The state's day (centre) and night (right) temperatures are likely to be warmer in the south and west of the state.

<http://www.bom.gov.au/climate/outlooks/#/overview/summary/>

### Ocean temperatures

Comparison of ocean temperatures in early March (above) and late January (below) show increased warming in the tropical Pacific.

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



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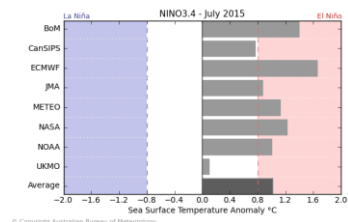


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## Models suggest renewed warming by July

Most models forecast tropical Pacific Ocean sea surface temperatures to be above average in coming months, with values reaching El Niño thresholds in July. However, forecasts spanning February to May generally have lower accuracy so should be treated with caution.

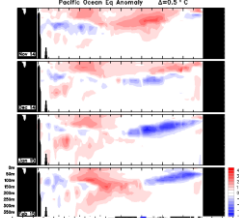
<http://www.bom.gov.au/climate/ahead/model-summary.shtml#tabs=Pacific-Ocean>



## Pacific subsurface is warming

Warm anomalies have increased in the western and central equatorial Pacific sub-surface, more than 2.5°C in western parts of this region, due to weakened trade winds and tropical surface currents in recent weeks. Weakened trade winds are forecast to continue, and this may induce further warming.

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



## El Niño moves to watch status

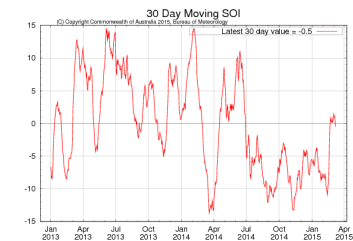
The Bureau's ENSO Tracker has been upgraded to El Niño Watch (50% chance of El Niño forming in 2015) due to warmer temperatures in the tropical Pacific.

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

## SOI remains negative

The Southern Oscillation Index has returned to neutral. Recent negative values were primarily caused by transient weather systems in the vicinity of Tahiti.

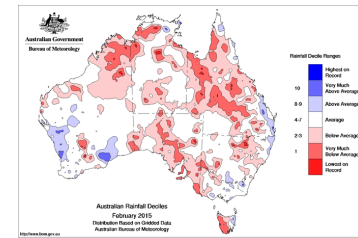
<http://www.bom.gov.au/climate/enso/#tabs=SOI>



## Below average rainfall in February

Rainfall during February was below average for large parts of Australia, including northeast and south-west NSW. It was NSW's driest February since 2006, and warmest mean temperatures since 2007.

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



## 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

## 2015 NSW drought strategy

The 2015 NSW Drought Strategy is a long-term strategy to help farmers become more resilient and better prepared for future droughts, and improve their business and reduce risks. The strategy includes a farm innovation fund, vocational training and farm business planning, enhanced network of weather stations, development of a commercial multi-peril insurance sector for our cropping sector, and research to develop drought resistant crops and improve water efficiency.

<http://www.dpi.nsw.gov.au/agriculture/emergency/drought/support/nsw-drought-strategy>

## Researchers model crop response to climate change

NSW DPI has been part of a research team modelling the response of six key crops to climate change using climate projection data. The team modelled wheat, barley, lupin, canola and field peas at Wagga Wagga in NSW, Cunderdin and Katanning in WA and Hamilton in Victoria, using three different soil types at each location. They found that reduced rainfall is expected to reduce both crop biomass and grain yield in all four locations. This means farmers and breeders need to focus on breeding varieties that are more drought-tolerant and heat-resistant, and adopting strategies to retain more moisture in the soil. Better weather forecasting will also allow farmers to make better planting and cropping plans.

<http://www.sciencewa.net.au/topics/agriculture/item/3303-climate-projections-show-ways-to-improve-crop-yields>

## Warming will reduce wheat supply without adaptation

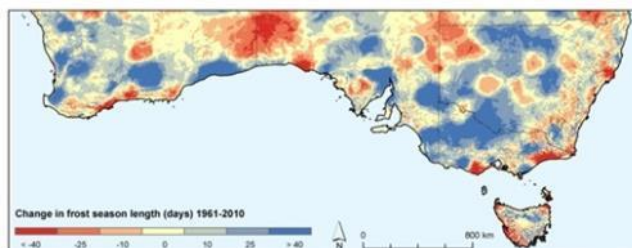
A global team of agrosystem modellers has concluded that the future global wheat harvest is likely to be reduced by 6% per each °C of local warming if not adaptation takes place. The modellers systematically tested 30 different wheat crop models against field experiments where growing season mean temperatures ranged from 15°C to 26°C. Their findings indicate that warming is already slowing yield gains at a majority of wheat-growing locations. The year-to-year yield variability weakens supply stability and amplifies market/ price fluctuations.

<http://www.luke.fi/en/tiedote/global-warming-reduces-wheat-production-markedly-if-no-adaptation-takes-place/>

## Frost update

GRDC research has found increased incidence of frosts in southern NSW and northern Victoria since 1970, mostly in August, with up to six consecutive days with minimum temperatures at or below 2°C, and the last frost occurring up to three weeks later. The changes are driven by a long-term southerly shift of the high pressure band typically located over central Australia in spring. 86% of frost events in September to November occurred in association with high pressures systems. More extreme events were associated with highs centred further south and west.

<http://grdc.com.au/Research-and-Development/GRDC-Update-Papers/2015/02/Jack-of-frosts-recent-trends-and-drivers-of-change>



**Trends in the frost season duration during August to November (1961 to 2010). Dark grey areas are having longer frost seasons.**

## Australia's climate in 2014

BoM's 2014 climate report provides a national overview of temperature, rainfall and significant events, including heatwaves, bushfires and storms.

[http://www.bom.gov.au/climate/annual\\_sum/2014/AnClimSum2014\\_LR1.0.pdf](http://www.bom.gov.au/climate/annual_sum/2014/AnClimSum2014_LR1.0.pdf)

## Climate change and extreme heat

This report from the Climate Council shows that the number of heatwave days has increased over much of Australia, particularly the eastern half. The first heatwave of the season is occurring earlier, and the hottest day in a heatwave is becoming hotter.

<http://www.climatecouncil.org.au/quantifying-extreme-heat>

## Extreme heat and bushfires in WA

This Climate Council report describes the background context of extreme heat and bushfires in WA and how climate change is intensifying these events.

<http://www.climatecouncil.org.au/the-heat-is-on-climate-change-extreme-heat-and-bushfires-in-wa>

## Devastating weather patterns will continue

Devastating weather patterns and increasing temperatures will last into the foreseeable future as global warming is expected to continue, according to the World Meteorological Organisation. High sea temperatures contributed to exceptionally heavy rainfall and floods in many countries in 2104 and extreme drought in others.

<http://www.wmo.int/media/?q=content/warming-trend-continues-2014>

## NSW coastal flooding history

Analysis of major floods and associated weather systems in coastal catchments from Brisbane to Eden NSW from 1860 to 2012 found that the 253 major floods in this period were associated with either east coast lows or tropical interactions. The lows triggered more major floods than the tropical interactions, but the latter caused more deaths from freshwater flooding and over twice as many deaths per event. Some of the most extreme events identified occurred in the 19th century and early-to-mid 20th century. If such events were to occur today they would have catastrophic impacts due to the massive increase in urban development in the study region since that time.

<http://www.bom.gov.au/amoj/papers.php?year=2014>

## Flood ready farming strategies

A steering group of dairy farmers, milk processors, industry organisations and government support agencies has developed a flood ready strategy for north coast dairy farmers with priority actions for flood preparedness, response and recovery. A similar strategy has also been developed with the sugarcane industry.

<http://www.dpi.nsw.gov.au/agriculture/emergency/flood>

## Local rain app

A Flinders University student has developed a rain app AusRainAR which allows Smartphone users to hold their phone to the clouds and 'see' areas around where it is raining. The app also features a rain distance indicator.

<https://ausrainar.wordpress.com/>

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## Summer afternoon rain depends on soil moisture

When Swiss researchers looked at summer afternoon rain they found that it tends to rain most on days with high soil moisture, but most rain falls over the driest sub-region. Over the course of a day, the sun warms the earth's surface, causing surface and soil water to evaporate. This water vapour rises, meets colder layers of air and condenses. It then starts to rain. Within a humid area, areas with lower soil moisture produce the warmest air, permitting the water vapour to rise the highest and thus meet the colder air layers the soonest. As a result, it rains most frequently at these locations.

<https://www.ethz.ch/en/news-and-events/eth-news/news/2015/03/how-rain-is-dependent-on-soil-moisture.html>

## Intense drying in US west

Eleven of the past 14 years have been drought years in much of the US west. California water officials last year cut off the flow of water from the northern part of the state, forcing farmers in the Central Valley to leave hundreds of thousands of acres unplanted. Projections for intense drying indicate current agricultural and water resource management is unsustainable.

<http://www.earth.columbia.edu/articles/view/3232>

## Coffee and climate

Coffee and climate is an international initiative of key players from the private, development and research sectors to enable coffee farmers to respond effectively to changing climatic conditions. The initiative has just released an on-farm guide to adaptation, and a toolbox of methodologies, guidelines and training materials.

<http://www.coffeeandclimate.org/>

## El Nino's global drought impact

This new publication uses FAO's Agricultural Stress Index which highlights anomalous vegetation growth and potential drought in arable land during a given cropping season.

<http://www.fao.org/publications/card/en/c/67da3ac0-734e-4bf2-aeac-3cb09b419623/>

## BoM is tweeting

BoM has expanded its Twitter presence to include regular tweets about current and forecast weather events. The twitter account handle @BOM\_NSW will tweet information relevant to New South Wales, while the national account handle @BOM\_au will tweet corporate messages or weather information relevant to multiple states and territories.

<http://media.bom.gov.au/social-media/>

## Adapt NSW newsletter

The latest issue of the Adapt NSW newsletter includes a video clip of NSW farmers sharing their stories about adapting to climate change.

<http://climatechange.environment.nsw.gov.au/Adapting-to-climate-change/Adaptation-Research-Hub>

## The science of climate change

The Australian Academy of Sciences has updated its booklet 'The science of climate change' to be relevant to the everyday concerns of people and organisations, and to support those who want to take meaningful climate action.

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<https://www.science.org.au/climatechange>

## **NASA climate change evidence**

This NASA Global Climate Change site provides a host of facts and evidence about climate change and global warming.

<http://climate.nasa.gov/>

## **EMISSIONS**

### **New milestone for CO2 levels in February**

The average CO2 levels at Mauna Loa in Hawaii topped 400 parts per million in February, the first time that this has been seen in a northern winter month. The site first recorded daily levels of atmospheric carbon dioxide at 400 ppm in 2013. Last year the average hit 400 ppm in April, and remained above this level for three months.

<http://theconversation.com/february-carbon-dioxide-levels-average-400ppm-for-first-time-38417>

### **ERF method for avoiding clearing of native growth**

The Emissions Reduction Fund has approved the method 'Avoided clearing of native growth' to reduce emissions associated with land clearing. The method is similar to the methods for avoided deforestation and native forest from managed regrowth.

<http://www.environment.gov.au/climate-change/emissions-reduction-fund/methods/avoided-clearing-native-regrowth>

### **Methane in Australian agriculture**

This review outlines the principal Australian agricultural sectors involved in methane flux, factors controlling the flux, mitigation strategies, and future research directions.

<http://www.publish.csiro.au/nid/40/paper/CP14116.htm>

### **Equation shows link between emissions and warming**

UK researchers have derived the first theoretical equation to demonstrate that global warming is a direct result of the build-up of carbon emissions since the late 1800s. Every million-million tonnes of carbon emitted generates one degree Celsius of global warming.

[http://www.southampton.ac.uk/mediacentre/news/2014/dec/14\\_222.shtml](http://www.southampton.ac.uk/mediacentre/news/2014/dec/14_222.shtml)

### **Global lifestyle calculator**

The Global Calculator is a model of the world's energy, land and food systems to 2050, developed by the UK Government and European Union to help users calculate links between lifestyle, energy use, and the climate consequences.

<http://www.globalcalculator.org/>

## **WATER**

### **Review of MDB water planning and climate change**

This review found that better water planning and a more complete understanding of the effects of irrigation on regional climate evapotranspiration could increase the overall benefits

of water use, improve riparian environments, and be achieved with only small effects on the profits and gross value of food and fibre production.

<http://link.springer.com/article/10.1007%2Fs13280-014-0495-x>

## Australia's water governance

A policy brief from Future Directions International on Australia's water governance concludes that significant progress has been made since 2004, and recommends aligning groundwater management with surface water management, reducing over-regulation, and introducing equitable licensing arrangements for all user groups.

<http://www.futuredirections.org.au/publications/food-and-water-crises/2108-australia-s-water-security-part-3-reform-governance>

## Salinity management review

A recent review of the 15 year MDB's salinity management strategy has proposed a further 15 year program to manage salinity risk.

<http://www.mdba.gov.au/sites/default/files/pubs/General-Review-of-Salinity-Management.pdf>

## Our Water website and WaterLive app

The NSW Office of Water has introduced its Our Water website and WaterLive app to provide the community with live water data across the state.

<http://www.ourwater.nsw.gov.au/>

<http://www.water.nsw.gov.au/realtime-data/default.aspx>

## Irrigation technologies tour

The 2015 Cotton Irrigation Technology Tour showcased a number of irrigation technologies, including scheduling with dynamic deficits, canopy temperature sensor, IrriSAT weather based irrigation scheduling, EM38 soil moisture monitoring, VARlwise site-specific surface irrigation and fertigation using adaptive control, and smart automation in furrow irrigation.

<http://www.cottoninfo.com.au/publications/cotton-irrigation-technology-tour-booklet>

## CSIRO rainwater tank survey

A recent CSIRO survey of rainwater tank use highlights the need for more sustainable management, including installation practices, maintenance, and development of robust, long lasting simple technologies, including alarms.

<http://csironewsblog.com/2015/02/11/its-raining-water-tanks-top-tips-for-keeping-them-healthy-and-efficient/>

## LCA of tap water

Swiss research into the life cycle assessment of tap water found that from an environmental point of view, tap water is preferable to bottled water and all other beverages.

<http://www.esu-services.ch/fileadmin/download/jungbluth-2014-article-LCA-TapwaterAndBeverages.pdf>

## Water in the world we want

This new UN report warns that within 10 years, 48 countries will be classified water-scarce or water-stressed, and by 2030, overall global demand for freshwater will exceed supply by 40%. The report recommends sustainable advancements in water, wastewater, and

sanitation management, and holding agriculture and energy sectors accountable for making efficiencies.

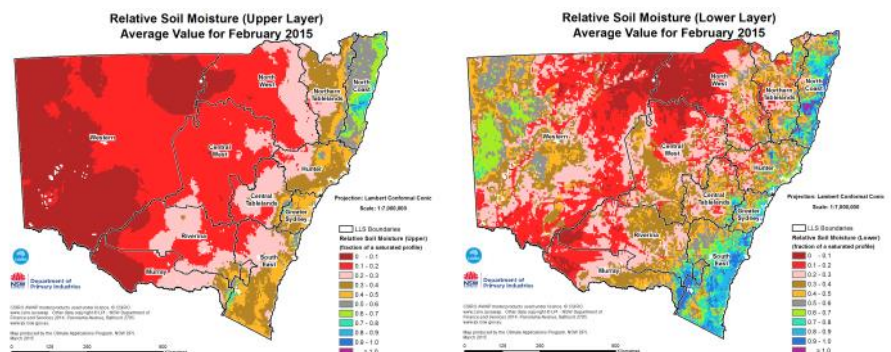
<http://inweh.unu.edu/invest-water-prevent-conflict-new-report/>

## SOILS

### NSW soil moisture

Topsoil moisture is low across NSW, except on the north coast which benefited from Cyclone Marcia rainfall in February. Subsoil moisture is low through the centre of state, particularly in the north. Coastal regions have reasonable subsoil moisture.

[http://www.eoc.csiro.au/awap/cqi/awap2.pl?ser=Australia\\_ops26j\\_monthly](http://www.eoc.csiro.au/awap/cqi/awap2.pl?ser=Australia_ops26j_monthly)



### Crop sequencing benefits soils in low rainfall environments

A crop-sequencing trial run by GRDC and Mallee Sustainable Farming has found that having a break from continuous wheat can be beneficial in low rainfall environments, particularly in tired soils or in paddocks with high weed burdens. The trial found that continuous wheat was in the lower end of gross returns in a wide range of rotations tested. While break crops may not generate an income in the year of planting they added nitrogen, reduced weed burdens and boosted water availability to the following crop.

<http://www.theland.com.au/news/agriculture/cropping/general-news/hitting-breaks-good-for-mallee-crops/2724587.aspx>

### Nitrogen fertilisers reduce rhizobia effectiveness

When exposed to nitrogen fertiliser over a period of years, the nitrogen-fixing bacteria rhizobia evolves to become less beneficial to legumes -- the plants they normally serve. The evolution of less-cooperative rhizobia may have important environmental consequences.

[http://news.illinois.edu/news/15/0223fertilizer\\_KatyHeath.html](http://news.illinois.edu/news/15/0223fertilizer_KatyHeath.html)

### Improving nitrogen use efficiency

GRDC research into nitrogen use efficiency recommends doing a budget to assess N requirements, applying N fertiliser only when the crop needs it, using legumes in rotations, increasing soil organic matter to provide slow release mineral N and improve soil structure, and using N in crop residues.

<http://grdc.com.au/Research-and-Development/GRDC-Update-Papers/2015/02/Where-does-fertiliser-nitrogen-finish-up>



## Nutrient loss with increased farming intensity

NZ research measuring spillover effects of farming inputs has found a linear relationship between agricultural intensity and cumulative levels of nitrogen, phosphorus, uranium and cadmium in neighbouring forest soils.

<http://www.sciencewa.net.au/topics/agriculture/item/3333-increased-farming-intensity-prompts-nutrient-spillover>

## Indicators of soil health in grazing systems

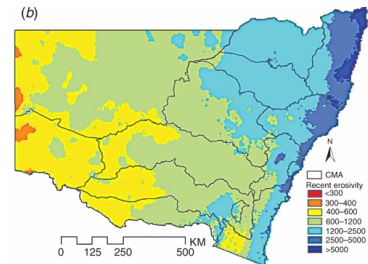
This Victorian study found a strong relationship between total soil carbon and cation exchange capacity, and concluded that although soil biological properties are useful indicators of changes in soil condition, any assessment of soil health must be based on region, soil textural class and land use-specific and relevant information.

<http://www.publish.csiro.au/nid/84/paper/SR14147.htm>

## Soil erosivity in NSW

A new study of soil erosivity in NSW provides baseline information and up-to-date estimates of rainfall erosivity and hillslope erosion for better monitoring, assessment, and mitigation of hillslope erosion risk in NSW.

<http://www.publish.csiro.au/nid/84/paper/SR14188.htm>



## Biochar and compost benefit each other

The International Biochar Initiative has published a research summary on the potential benefits of including biochar in composting operations, including shorter compost times, reduced rates of methane and nitrous oxide emissions, reduced ammonia losses, and reduced odour.

<http://www.biochar-international.org/compost>

## Plants can alter soil types

WA research has found certain plants, including Mallee, Morel and the Banksia species, have the ability to alter a soil type, and now surmise that WA's high grade bauxite deposits may have been made by certain Banksia species.

<http://www.sciencewa.net.au/topics/agriculture/item/3352-plants-found-to-alter-soil-types/3352-plants-found-to-alter-soil-types>

## Composting for sustainable agriculture

NSW DPI researchers Simon Eldridge, Nerida Donovan and Yin Chan (retired) have contributed a chapter on agronomic, soil quality and environmental consequences of using compost in vegetable production in this new book.

<http://www.springer.com/gp/book/9783319080031>

## Second edition of biochar book

NSW DPI scientists BP Singh, Lukas van Zwieten, Stephen Kimber and Annette Cowie have contributed chapters to the substantially updated second edition of 'Biochar for environmental management: Science, technology and Implementation'.

<http://routledge-ny.com/books/details/9780415704151/>

## **New edition of 'Understanding vineyard soils'**

A new edition of Robert White's influential book presents the latest updates on topics such as measuring soil variability, managing soil water, the possible effects of climate change, rootstock breeding and selection, monitoring sustainability, and improving grape quality.

<http://ukcatalogue.oup.com/product/9780199342068.do>

## **Societal value of soil carbon**

This article by renowned soil scientist Rattan Lal argues that agriculture is an engine of economic development and is integral to any agenda for addressing global issues of the twenty-first century such as food and nutritional security, climate change, energy and water demands, and biodiversity. (Also see Rattan Lal's recent WCSS presentation on the soil-peace nexus.)

<http://www.jswnonline.org/content/69/6/186A.full.pdf+html>

[http://www.20wcss.org/data/Rattan%20Lal\\_Slide.pdf](http://www.20wcss.org/data/Rattan%20Lal_Slide.pdf)

## **ENERGY**

### **Wind farm proposals to go to PAC for decision**

The NSW Department of Planning and Environment has recommended that proposals to establish wind farms near Yass and Crookwell be forwarded to the independent Planning Assessment Commission for decision. The Department has recommended that the Yass Valley proposal be refused, and the Crookwell proposal be approved with strict conditions.

<http://www.planning.nsw.gov.au/en-us/newscentre/latestnews.aspx>

### **New wind farm review**

A review by the National Health and Medicine Research Council has found no direct evidence that wind turbines affect physical or mental health, but did find a link between wind farm noise and indirect health effects such as annoyance, and sleep disturbance. Due to the generally poor quality of the current evidence, the council recommended further high quality research, particularly within 1,500 m of wind turbines.

<http://www.nhmrc.gov.au/guidelines-publications/eh57>

### **Poultry manure powers Queensland egg farm**

Queensland poultry farm Darling Downs Fresh Eggs is the first Australian egg producer, and one of only a few in the world, to power its business using renewable energy generated from poultry manure. The company expects to reduce its grid electricity usage by 60% in the first year, saving around \$250,000.

[http://biomassproducer.com.au/case\\_study/poultry-manure-to-power-in-the-darling-downs/#.VPvDI\\_mUc31](http://biomassproducer.com.au/case_study/poultry-manure-to-power-in-the-darling-downs/#.VPvDI_mUc31)

### **State of global biofuels**

This update of a 2006 report looks at the state of the biofuels market around the world, including transport fuel and trade flows for biofuels and related feedstocks.

[http://unctad.org/meetings/en/Miscellaneous%20Documents/Biofuels\\_draft\\_2\\_SmWithCover.pdf](http://unctad.org/meetings/en/Miscellaneous%20Documents/Biofuels_draft_2_SmWithCover.pdf)

## Bioenergy and biomass clips

Bioenergy Australia has an extensive library of free bioenergy and biomass videos.

<http://www.bioenergyaustralia.org/videos.php>

## Energy use in Australia's meat chicken industry

This RIRDC report on annual on-farm energy usage at SE Queensland meat chicken farms in south eastern Queensland looks at the relative contributions of on-farm components to identify opportunities to improve on-farm energy efficiency.

<https://rirdc.infoservices.com.au/items/14-124>

## BIODIVERSITY

### New edition of DPI weed control handbook

The sixth edition of this handbook is now available online to assist with noxious and environmental weed control in non-crop, aquatic and bushland situations.

<http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/publications/noxious-enviro-weed-control>

### NSW WeedWise

The NSW WeedWise website contains profiles of more than 300 noxious and environmental weeds, with details about their control, including registered herbicide options and legal requirements under the Noxious Weeds Act (1993). There is also a free NSW WeedWise smartphone app with the same information. The website and app have replaced Weed Primefacts and Weed Alerts although recently published Primefacts and Weed Alerts will still be available as PDF files on the Weeds Extranet until their content becomes out-of-date.

<http://weeds.dpi.nsw.gov.au/>

<http://extranet.dpi.nsw.gov.au/weeds>

<https://itunes.apple.com/au/app/nsw-weedwise/id966457643?mt=8>

### Helping communities control invasive animals

The CRC for Invasive Animals is seeking feedback on how it can more effectively support communities in controlling animals such as wild dogs, rabbits, feral cats and pest fish.

<http://invasives.org.au/blog/survey-help-reform-pest-animal-control/>

### Biological control for crofton weed in NSW

A new biological control agent for crofton weed, the rust fungus *Baeodromus eupatorii*, is now available for widespread release across NSW. CSIRO is currently setting up a web page with additional information, including guidelines for release. If you are interested in participating in the program contact the CSIRO Biosecurity Flagship.

[louise.morin@csiro.au](mailto:louise.morin@csiro.au) [john.lester@csiro.au](mailto:john.lester@csiro.au)



### Multiple stressors trigger bee breakdown

Australian researchers have found that multiple stressors can trigger total breakdown of bee society. Honey bees delay leaving their hive to forage until they are strong enough to forage for nectar and pollen. When external stressors such as pests or pesticides kill too many

forager bees at once, there is a rapid maturation of the next generation which leave the nest before they're ready, resulting in premature death. Modelling shows these deaths trigger a vicious cycle in which generations of inefficient foragers cannot return enough resources to keep the colony going, leading to its collapse.

<http://mq.edu.au/newsroom/2015/02/10/why-stressed-young-bees-early-start-to-foraging-can-lead-to-colony-collapse/>

## Domesticating grasses for climate change

Many species of native Australian grasses, legumes and forage shrubs are able to survive drought conditions and be productive in low fertility soils. The most common traits that need modification include retention of seeds on the parent plant to assist harvest and the selection for increased seedling vigour.

<http://www.publish.csiro.au/nid/40/paper/CP13406.htm>

## Crop sequence calculator

This online tool based on WA trial results and historic data compares crop sequence options and can be used to evaluate recent trials, compare grower experiences with experimental data, and compare gross margins for three year crop sequences.

<https://www.agric.wa.gov.au/sowing/wa-crop-sequence-calculator>

## Photomon app for project monitoring

WA's Northern Agricultural Catchments Council has developed Photomon to help with photo-monitoring of on-ground projects. The app includes a reminder when the next photo is due, an overlaid transparent reference photo for consistent field-of view for each monitoring point, automatic naming and geotagging, and space to write notes for each photo.

<http://www.nacc.com.au/photo-monitoring>

## 75% of seed diversity with smallholders

As much as 75 percent of global seed diversity in staple food crops is held and actively used by a wide range of small farmholders with 3-7 acres. The rest is in gene banks.

<http://news.psu.edu/story/344861/2015/02/13/research/world-crop-diversity-survives-peri-urban-remote-rural-locations>

## Red posts indicate weed infestations

Riverina & Central West councils have installed red guideposts to indicate the start and end of roadside weed infestations and ensure that local weeds officers are consulted on works at these sites. The project won the weeds management award at the 2014 NSW Local Government awards.

<http://www.riverinaweeds.org.au/ongoing-projects/>



## ChemFree weed management

The Weed's Network is convening a series of 'ChemFree Weed Management Workshops', and has partnered with LLS Sydney to hold a workshop in Sydney on 30 March 2015

<http://www.eventbee.com/v/chemfreeweediningsydney2015>

# FOOD

## Australian food systems need to improve

A policy brief from Future Directions International on Australian food systems concludes that Australian food producers must improve their sustainability, productivity and efficiency to meet rising food demand. Farm export value and volume must increase, but rising debt and low domestic capital in the agricultural sector create barriers to development. Climate change adaptation and mitigation strategies are necessary to ensure sustainable food production, and increased investment in agricultural research and development is essential to protect Australia's food security.

<http://www.futuredirections.org.au/publications/food-and-water-crises/2122-policy-briefing-paper-australian-food-systems>

## US low GHG diets

A US study has found that Mediterranean, vegetarian and fish-based diets have much lower GHG emissions impacts than business as usual dietary patterns. If the global population consumed an average of the Mediterranean, pescatarian and vegetarian diets combined, there would be no net increase in global food related emissions.

<http://discover.umn.edu/news/food-agriculture/live-longer-save-planet-better-diet-could-nail-both>

## UK low GHG diets

A UK study has found that if average diets conformed to World Health Organisation recommendations, associated GHG emissions would be reduced by 17%. Further reductions of up to 40% can be achieved through dietary shifts that include a reduction in animal products and processed snacks, and more fruit and vegetables.

<http://www.fcrn.org.uk/research-library/consumption/sustainability/potential-reduce-greenhouse-gas-emissions-uk-through-hea>

## Denmark's organic food plan

Denmark's Ministry of Food, Agriculture and Fisheries has launched a new strategy to double organic farming by 2020 and serve more organic food in national public institutions.

<http://www.thelocal.dk/20150130/denmark-announces-most-ambitious-organic-plan>

## Food policy symposium

These presentations from London's Centre for Food Policy recent symposium summarise current thinking on how to address the challenge of sustainable diets and consider the different approaches taken by key sectors.

<http://www.city.ac.uk/arts-social-sciences/sociology/research/centre-for-food-policy/city-food-symposia/2014>

## Food security conference papers

Papers from the First International Conference on Global Food Security in 2013 are now available free online.

<http://www.sciencedirect.com/science/journal/22119124/3/3-4>

## Food utopias

This new book offers a framework for collaborative action by scientists and practitioners, setting out options in food and agriculture systems that will enable us to eat well, engage more, be healthy and save the planet.

<http://www.routledge.com/books/details/9781138788497/>

## LAND USE

### Unravelling the complex web of global food trade

A study of nutrition, land use and water security dimensions of food imports and exports has found that more than one-fifth of the calories grown in farm fields, requiring 20% of the world's croplands, are ultimately traded. Australia dominates pasture and forage area embodied in ruminant exports (57% of the global total), but only 11% of the global pasture area.

<http://discover.umn.edu/news/food-agriculture/unraveling-complex-web-global-food-trade>

## SUSTAINABILITY

### NAB recognises sustainable practices in agriculture

The National Australia Bank is working with agricultural industry groups and associations to develop systems for measuring and benchmarking business returns from adopting sustainable practices and technologies. The bank's recent survey of over 5,000 farming customers found that 74 per cent had made changes to their businesses as a result of natural resource sustainability issues in the past two to three years. These issues include water scarcity, soil health, energy costs, minimising runoff and managing waste.

<http://business.nab.com.au/game-changer-for-agribusiness-banking-9392/>

### BMPs for sustainable agricultural intensification

This guide aims to enhance crop production, improve farm profitability and resource efficiency, and reduce environmental impacts related to crop production. It is published jointly by international organisations for fertiliser, water management and plant nutrition.

<http://www.ipni.net/article/IPNI-3392>

### Economic value of ecosystem services

NZ research assessing the economic value of biological pest control and nitrogen mineralisation in organic and conventionally grown crops found that the total economic value was significantly greater in organic systems, ranging from US\$1750-\$4536 per ha per year, compared with US\$1585-\$2560 in conventional systems.

<https://peerj.com/articles/762/>

### How to eat a wilderness

This essay by UWA academic Andrea Gaynor looks at the history of the WA wheatbelt and whether communities have sufficient capacity to transition to more sustainable production models and develop the social sustainability needed to address future challenges.

<http://insidestory.org.au/how-to-eat-a-wilderness>

## CSIRO science images library

CSIRO's science image library has over 4000 images of science and nature images that are free to download under a Creative Commons licence.

<http://www.scienceimage.csiro.au/>

## ECOS goes online

CSIRO's long running magazine ECOS is now published a free online newsletter. It will continue to raise awareness of ecological principles, and explain the challenges and benefits of good sustainable development and providing scientific perspectives.

<https://blogs.csiro.au/ecos/>

## EVENTS

2015	International Year of Soils <a href="http://www.fao.org/soils-portal/en/">http://www.fao.org/soils-portal/en/</a>
March 18-19	Water Innovation Forum 2015, Sydney <a href="http://www.awa.asn.au/EventDetail.aspx?id=4294979855">http://www.awa.asn.au/EventDetail.aspx?id=4294979855</a>
April 12-16	Australian Rangeland Society conference, Alice Springs <a href="http://www.arsconference.com.au">http://www.arsconference.com.au</a>
April 16-17	Environmental solutions from soil science, Canberra <a href="mailto:Richard.greene@anu.edu.au">Richard.greene@anu.edu.au</a>
May 12-14	Ozwater'15, Adelaide <a href="http://www.ozwater.org/">http://www.ozwater.org/</a>
May 26-27	NSW Nature Conservation Council bushfire conference, Sydney <a href="http://www.nature.org.au/healthy-ecosystems/bushfire-program/conferences/">http://www.nature.org.au/healthy-ecosystems/bushfire-program/conferences/</a>
May 26-28	Irrigation Australia regional conference, Sydney <a href="http://www.ial2015.com.au/">http://www.ial2015.com.au/</a>
June 3-4	Primary Industries Education Foundation Conference, Canberra <a href="http://www.primaryindustrieseducation.com.au/">http://www.primaryindustrieseducation.com.au/</a>
July 14	Agriculture and environment research symposium, Sydney “ <a href="mailto:Uta.stockmann@sydney.edu.au">Uta.stockmann@sydney.edu.au</a>
July 15-17	Australian Meteorological and Oceanographic Society conference, Brisbane <a href="http://www.amos.org.au">http://www.amos.org.au</a>
July 23-24	Current issues for soil science. Moree <a href="mailto:woodlots3@bigpond.com">woodlots3@bigpond.com</a>

## SUBSCRIBE

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](mailto:rebecca.lines-kelly@dpi.nsw.gov.au).