

SOIL matters

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Welcome to Soil Matters, a bimonthly newsletter providing updates and information on soil, weather and industry developments to support on-farm decision making within the SA Murray-Darling Basin. This newsletter will draw together a number of resources including:

- Bureau of Meteorology seasonal outlook
- SA Murray-Darling Basin weather station network
- SA Murray-Darling Basin soil moisture probe network
- Upcoming grants, programs and projects relevant to your region.

This is a newly developed newsletter, we would appreciate any feedback on content and are happy to assist with any inquiries regarding the featured tools and projects. Please contact Eliza Rieger, Regional Landcare Facilitator on eliza.rieger@sa.gov.au or 0408 416 684 for more information.

Alternatively you can subscribe to a hard copy of the newsletter by emailing eliza.rieger@sa.gov.au



Photo of the month

Tony Randall, Land and Water Management Team Coordinator checks the soil pH of Riverland districts soil samples. The purple colour indicates these soil types are highly alkaline. Alkaline soils can prevent nutrients such as calcium, magnesium or manganese being available to the plant



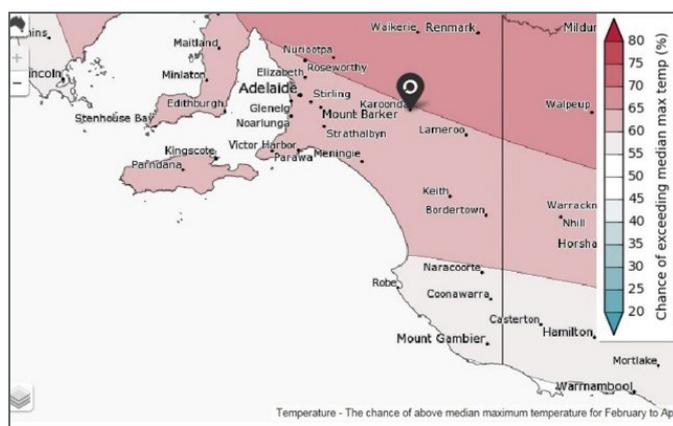
BOM Weather Forecast

The following information has been sourced from the Bureau of Meteorology 'Climate Outlook-monthly and seasonal' issued on 25 January 2017.



Chance of exceeding median rainfall (%)

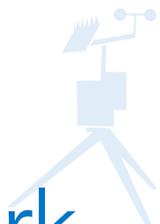
- There is a 35-40% chance of exceeding median rainfall in the Eastern Mount Lofty Ranges over the February-April 2017 period; median rainfall recorded in Rockleigh over this period is 43mm. Past accuracy for this district is high.
- There is a 35-40% chance of median rainfall for the Riverland districts over the February-April 2017 period; recorded median rainfall at Waikerie over this period is 45mm. Past accuracy for this district is high.
- There is a 35-40% chance of median rainfall for the Mallee districts over the February-April 2017 period; recorded median rainfall at Lameroo over this period is 60mm. Past accuracy for this district is moderate



Chance of exceeding median temperature (°C)

- There is a 60-65% chance of exceeding median maximum temperatures in Eastern Mount Lofty Ranges over the February-April 2017 period; recorded median maximum temperature in Ashbourne during this period is 24°C, and 24.9°C in Rockleigh. Past accuracy for these districts is moderate.
- There is a 65-70% chance of exceeding median maximum temperatures in the Riverland districts over the February-April 2017 period; recorded median maximum temperature in Waikerie during this period is 28.4°C. Past accuracy for the district is moderate.
- There is a 60-70% chance of exceeding median maximum temperatures in the Murray Mallee districts over the February-April 2017 period; recorded median maximum temperature for Lameroo during this period is 27.1°C. Past accuracy for these district is moderate.

SAMDB weather station network



The following climatic observations have been made over the period from 16 December 2016 to 16 January 2017. Higher rainfall has been recorded in some districts when compared to 2015/16 values, this has delayed harvests in some districts and may result in increased summer weed pressure.

Burra December/January Conditions:

Over the 31 day period, the average maximum temperature for Burra was 29.5°C with 5 days reaching above 40°C. Average maximum temperature was 5°C cooler than last year's records. A similar pattern is occurring within the soil temperatures with the average soil temperature of 26.4°C sitting 7.5°C cooler than last year's records. Cooler soil temperatures in combination with seasonally low average diurnal temperature fluctuations (7.9°C) may help create favourable conditions for nutrient mineralisation by soil microbial communities. The monthly rainfall was slightly higher than 2015-16 values with 13.2mm.

Currency Creek December/January Conditions:

Slightly cooler temperatures were recorded between December 2016 and January 2017 with a daily average maximum temperature of 25.7°C. Average diurnal soil temperature fluctuations of 10.4°C were recorded. Temperature fluctuations may affect soil mineralisation however the high monthly rainfall and decreased average daily evapotranspiration (5.5mm) should aid soil moisture levels and increase mineralisation potential. The monthly rainfall recorded was 57.4mm, significantly higher than the 3.4mm record from the same time last year. A large proportion of this rainfall was recorded over a two-day period, this may have allowed for the rain to infiltrate through the full soil profile. The high volume of rainfall over a short period may have increased the erosion risk for bare soils, creeks and rivers.

Taylorville December/January Conditions:

Over the 31 day period, the average daily maximum temperature was 32.5°C, with 3 days reaching over 40°C. These temperatures are slightly less than records from the same time last year (34°C). Soil temperatures reflect the atmospheric temperatures with an average temperature of 29.8°C, lower than last year's record of 34°C. Despite seasonal variations, diurnal soil temperature fluctuations of 15°C remain the same when compared to records from the same time last year.

These results may reflect a seasonal decrease in soil cover at the site. Average relative humidity was recorded at 54% and this may reflect the increased rainfall with 39.4mm recorded. The increased soil moisture and warm soil temperatures may result in both increased soil mineralisation and weed pressure for the district.

Sherlock December/January Conditions:

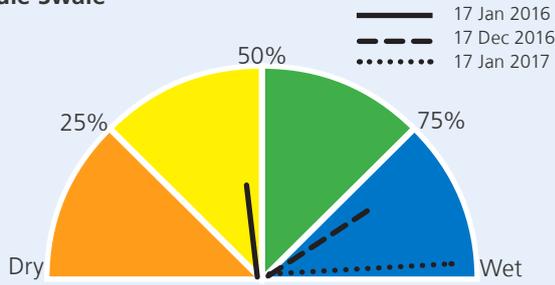
Over the 31 day period, the average daily maximum temperature was 30°C with 3 days reaching over 40°C. These records are 2.6°C cooler than last year's average records. Sherlock soil temperature records were high with 22 days of the month reaching over 30°C, average maximum daily soil temperature was 31.3°C, approximately the same as records from this time last year. The monthly recorded rainfall of 60mm was significantly higher than records from the same time last year, however 43.4mm of the 60mm rain fell over a 24 hour period. High rainfall over four days may have increased the capacity for the moisture to infiltrate deep into the soil profile. Despite high rainfall, relative humidity was very low for the district with only two days reaching over 60% relative humidity, this will increase vegetative moisture requirements and affect soil moisture stored within the profile. Evapotranspiration records were high with an average of 7.6mm/day.

SA Murray-Darling Basin Soil Moisture Probe Network:

The information below is a dial representation (Dry-Wet) of plant available soil moisture recorded at eight sites from the Natural Resources SA Murray-Darling Basin soil moisture probe network. The below information is based on data

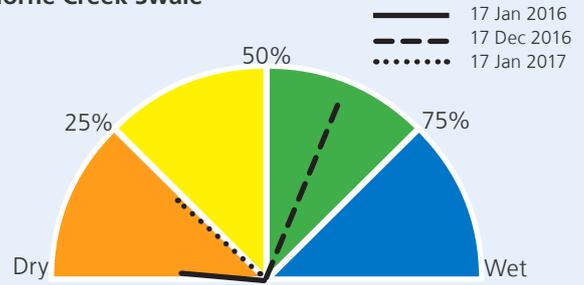
recorded on 17 January 2017, 17 December 2016 and 17 January 2016. The dials below are provided with support from Agriculture Victoria Soil Moisture Monitoring calculations.

Lowaldie Swale



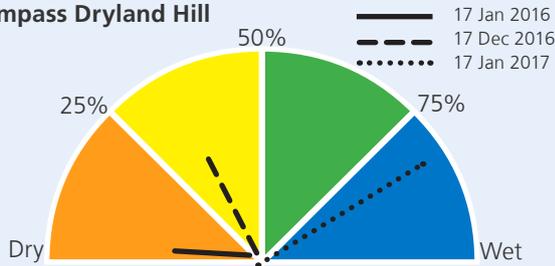
Recent rains have topped up the soil moisture profile with current levels sitting near 100%, an increase from approximately 78% recorded last month.

Langhorne Creek Swale



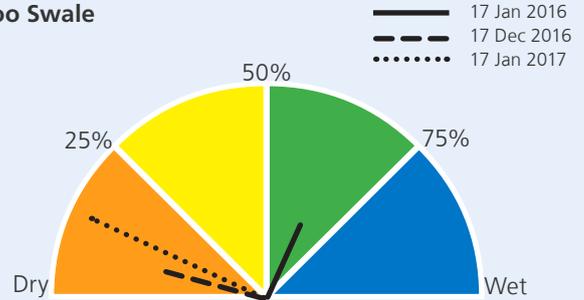
Soil moisture levels have increased by approximately 35% over the past month. The soil profile was empty at the same time last year.

Mt Compass Dryland Hill



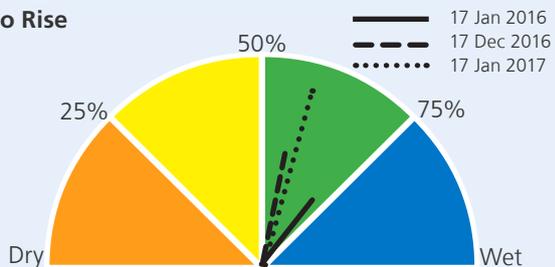
Recent rains have topped up the soil moisture profile with current levels sitting near 80%. The soil profile was empty at the same time last year.

Pinaroo Swale



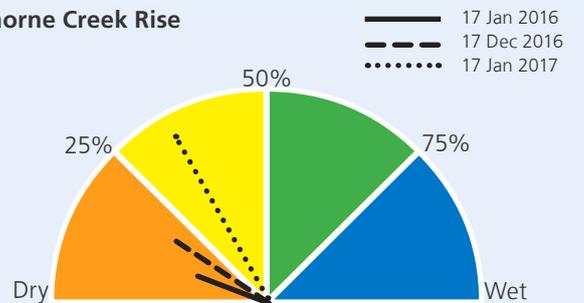
Soil moisture levels have increased slightly over the last month however current levels remain at less than 20%. The soil profile was holding significantly more moisture this time last year.

Pinaroo Rise



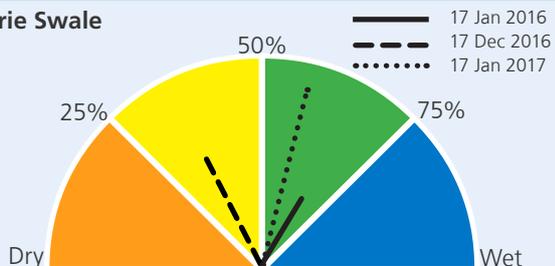
Soil moisture levels are sitting close to 60%, slightly higher than records from December 2016. The soil profile is dryer than the same time last year.

Langhorne Creek Rise



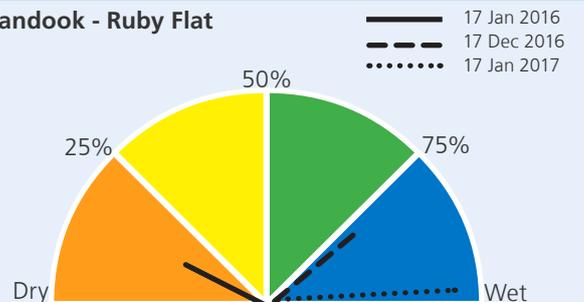
Soil moisture levels have increased over the last month with current levels approaching 40% full. The current soil moisture is significantly higher than the same time last year.

Waikerie Swale



Soil moisture at the Waikerie site has increased over the past month with current records indicating the soil is at approximately 60% capacity. Current soil moisture records indicate there is less plant available moisture than January 2015.

Coomandook - Ruby Flat



Recent rains have topped up the soil moisture profile with current levels sitting near 100%. Current levels are significantly higher than the records from this time last year.



Soil of the month: Deep sandy loam

This soil profile information has been compiled drawing on information from 'The Soils of Southern South Australia Volume 1' (James Hall, David Maschmedt and Bruce Billing).

Production:

Deep sandy loams are common throughout the Mount Lofty Ranges, totalling 0.3% (54 100ha) of soils in Southern Australia. These soil types are frequently found in drainage depressions, creeks and river flats, broad alluvial plains (i.e. Angas and Bremer river plains), lake floors, alluvial fans, lower slopes and some flats and plains. These soils possess good soil drainage and water holding capacity, the irrigation potential is generally good. These soil types commonly support livestock grazing or native vegetation.

Nutrition:

Due to the low clay content, fertility is moderate to low in this soil type. Clay content acts to retail nutrients, deep sandy loam soils rely on the organic content found within the enriched topsoils to provide nutrients.

Management:

These soils have highly variable pH which range from strongly alkaline, neutral to highly acidic. Acidic sandy loam soils are usually associated with areas of high rainfall. Sandy loam soils require their pH to be monitored and possibly managed with lime if acidic, or increased organic matter if alkaline.

Increasing soil cover can help retain soil moisture and enhance the accumulation of organic carbon within the topsoil, enriched organic material will help retain nutrients and overcome nutrient leaching within sandy loam.

The soil structure can range from massive to hard. Encouraging year round root development and increasing the organic carbon content will help increase water moisture content and decrease soil density.



Above: Image credit David Maschmedt, East-southeast of Mt Compass



Above: Image credit Colin Cichon



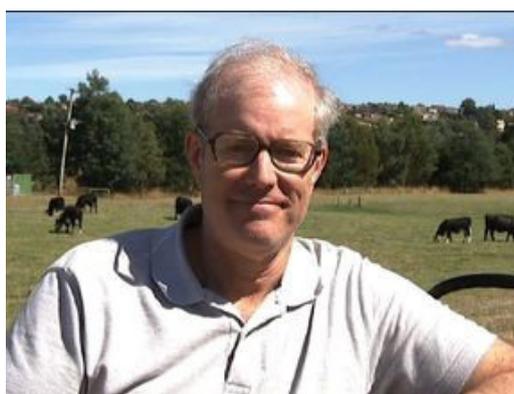
Scratching the Surface; soil biology in agriculture forum

From nutrient availability and soil moisture content right through to carbon sequestration; soil biology has recently found itself at the forefront of many discussions as we try to understand its true role within our farming systems.

As biological approaches to farming continue to gain momentum amongst both producers and consumers alike, farmers are increasingly asking the question 'how does this type of farming effect on-farm and economic sustainability?'

The Scratching the Surface; Soil Biology in Agriculture' forum will gather the world's best brains in biological farming and provide participants with the opportunity to ask the questions of the experts.

Joel Salatin (pictured), internationally renowned farmer, lecturer and regenerative farming's lead proponent will be the keynote presenter for the day. Dubbed by 'Time Magazine' as the world most innovative farmer, Joel will tackle the hard questions surrounding the implementation of biological processes while balancing the bank books.



Joel comments on how he manages his 220ha farm in Virginia USA.

"Our main deal is pastured livestock. So we have beef cattle, pigs, turkeys, laying chickens, meat chickens, rabbits, lamb and ducks - egg-layer ducks. And so there's a pretty wide assortment of animals that we move around the pasture and they're intricately related so that, for example, we follow the cows with egg mobiles and the chickens scratch through the cow patties, eat out the fly larva, spread out the dung, you know, in the fields so that it fertilises a lot more ground and doesn't make overly fertilised spots in other places.

So, we're consistently seeing how to integrate rather than segregate the livestock".

"The average farm in our community generates about \$250 per acre in gross annual sales. We generate \$8,000 per acre in annual gross sales because we're layering these different species symbiotically and synergistically on the pasture'.

For the full ABC Landline interview see <http://www.abc.net.au/landline/content/2014/s3955003.htm>

Also on the program is Australia's own Walter Jehne from Healthy Soils Australia, Walter has a rich history of increasing soil carbon and water holding capacity through applying a biological approach to on-farm management. Walter's capacity to guide his audiences through the complex processes will make for an exciting end of forum panel session with all guest presenters. Following the forum Walter Jehne and Dick Richardson will be hosting a half day farm walk, providing attendees with the opportunity to see the landscape through Walter and Dick's eyes.

Other presenters include:

- Dick Richardson, Grazing Naturally
- Associate Professor Tim Cavagnaro, Adelaide University
- Dr Ash Martin; representative from LawrieCo in combination with local broadacre producers
- Dr Nigel Wilhelm from SARDI.

Set to be held on **Wednesday 1 March 2017** at One Paddock Vineyard, Currency Creek, the forum will facilitate discussion between researchers, farmers and advisors. Come prepared with your soil health questions.

Register for the forum at <https://scratching-the-surface.eventbrite.com.au>

This forum is jointly hosted by the Ranges to River Natural Resources Management Group, SA Murray-Darling Basin Natural Resources Management (NRM) Board, Adelaide and Mount Lofty Ranges NRM Board and the Kangaroo Island NRM Board with funding from the Australian Government's National Landcare Programme, the NRM Levy and the Regional Landcare Facilitator Programme.

Want to know more?

T: Eliza Rieger on 0408 416 684

E: eliza.rieger@sa.gov.au



Scratching the Surface; soil biology in agriculture

with Joel Salatin, Walter Jehne and Dick Richardson

This forum is designed to link soil biology to more sustainable, productive farming systems. Hear from leading producers, agro-ecologists and microbiologists to help us understand the latest science and the 'best bet' economical solutions to improve soil health and production.

- Wednesday 1 March - all day forum (\$53.24 per person)

Register at: <https://scratching-the-surface.eventbrite.com.au>

Registrations close on Thursday 23 February.

Scratching the Surface

Soil Biology in Agriculture Forum

With Joel Salatin, Walter Jehne and Dick Richardson. Join leading producers, agro-ecologists and soil biologists as they provide their insights into soil biology and how it can be used to increase on-farm productivity.

Register at <https://scratching-the-surface.eventbrite.com.au>

Wednesday 1st March 2017 | 9am–5pm
One Paddock Vineyard, Currency Creek



Perfect Pastures Conference

Keynote Speakers include:

- Ken Solly, Solly Business Services Inaugural 2016 Australian Rural Consultant of the Year: Resilience in rural farming communities. Lambert Estate
- Alan Humphries: South Australian Research and Development Institute, Principal Research Scientists: Latest in Pasture Research

Other presenters include:

- Brian Hughes (PIRSA)
- Georgie Keynes (Technical Facilitator at Barossa Improved Grazing Group)

Where: 55 Long Gully Rd, Angaston SA.

Cost: \$50 - includes key note presentations, site visits and dinner

For more information and to register: <http://biggroup.org.au/event/perfect-pastures-conference/>

BAROSSA IMPROVED GRAZING GROUP
BIGG

PERFECT PASTURES

Optimising your sustainable grazing systems

Thursday, February 16th
ANGASTON | 1:30pm - 9pm | \$50 per person
Highlights: presentations, site visits and dinner

REGISTRATION OPEN

Supported by:
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SA Murray-Darling Basin

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MEAT & LIVESTOCK AUSTRALIA



Whats on in the region

2017 SANTFA Conference Tackling soil regeneration

When: 24 February 2017

Where: Barossa Arts and Convention Centre
Magnolia Road Tanunda, SA

The four speakers; two from the United States and two from the Eastern States of Australia, will discuss their experiences with establishing and managing regenerative agricultural systems and what can be achieved from working with nature to enhance soil health, vitality and productivity.

Speakers include

- John Heermann
- Ben Beck
- Rick Bieber
- Grant Sims.

For more information, full program and how to register:

<http://www.santfa.com.au/wp-content/uploads/SANTFA-Conference-2017-1.pdf>



Farmers Markets in the region

Adelaide Hills Farmers Market

Where: 23 Mann Street, Mount Barker
When: 8:30-12:30 every Saturday

Goolwa Wharf Markets

Where: Goolwa Wharf, Goolwa
When: first and third Sunday of every month at 9am to 3.30pm

Mount Compass Produce and Craft Market

Where: Wetland Car park, Sam Court, Mount Compass
When: Markets are held on the first Saturday of January, February, March, April, October, November and December.

Murray Bridge Farmers Markets

Where: The Wharf area, Sturt Reserve, Murray Bridge
When: every Saturday at 8am to 12pm

The Riverland Farmers Markets

Where: Berri Senior Citizens Hall, Crawford Terrace, Berri
When: 7:30-11:30am every Saturday

Strathalbyn Farmers Markets

Where: On South Terrace near the Old Strath Railway
When: Every third Sunday of the month

Contacts

Natural Resources Centre Murray Bridge

110A Mannum Road Murray Bridge SA 5253
T. 8532 9100 | F. 8531 1843

Natural Resources Centre Berri

2 Wade Street Berri SA 5343
T. 8580 1800 | F. 8582 4488

E. samdbenquiries@sa.gov.au

For more information on natural resources management in the region, the SAMDB NRM Board and its activities, please visit www.naturalresources.sa.gov.au/samurraydarlingbasin



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Murray-Darling Basin



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