



Live fast, die young: Soil microbes in a warmer world

Date:

8 September 2014

Source:

Northern Arizona University

Summary:

The mortality of soil microbes in warmer temperatures may affect soil carbon storage, scientists say. Soil microbes consume organic carbon compounds in soil, use some of it to make more microbes and release the rest to the atmosphere as carbon dioxide. The efficiency with which microbes use their food to make new microbes affects how much carbon remains in soil, and how much is released back to the atmosphere. The accepted idea before this study was that microbes would become less efficient at warmer temperatures.



Aerial view of the Northern Minnesota landscape including numerous conifer peatlands, deciduous uplands and lakes.

Credit: USDA Forest Service Northern Research Station

Warmer temperatures shorten the lifespan of soil microbes and this may affect soil carbon storage, according to a new NSF-funded study published in *Nature Climate Change* this week.

A research team led by Shannon Hagerty and Paul Dijkstra from Northern Arizona University measured two key characteristics of soil microbes that determine their role in the soil carbon cycle: how efficiently they use carbon to grow and how long they live. "Higher temperatures make microbes grow faster, but they also die faster," said Hagerty, who conducted the research as part of her master's degree and was lead

author on the study.

Journal Reference:

Shannon B. Hagerty, Kees Jan van Groenigen, Steven D. Allison, Bruce A. Hungate, Egbert Schwartz, George W. Koch, Randall K. Kolka, Paul Dijkstra. **Accelerated microbial turnover but constant growth efficiency with warming in soil.** *Nature Climate Change*, 2014; DOI: [10.1038/nclimate2361](https://doi.org/10.1038/nclimate2361)

<http://www.sciencedaily.com/releases/2014/09/140908204314.htm>

Gypsum rock revealed as new water source for life

Bec Crew

Monday, 08 September 2014

Scientists in Spain have discovered an entirely new water source for plant life called gypsum rock, and it's providing up to 90 percent of some plants' fluid requirements.



Image: [Ghislain118/Wikimedia](#)

A team of scientists led by plant physiologists Sara Palacio from the Instituto Pirenaico de Ecología and Juan Pedro Ferrio of the University of Lleida in Spain looked into how the desert shrub, *Helianthemum squamatum*, gets the water it needs to survive. Nicknamed the rock rose, this plant boasts clusters of bright, canary yellow flowers, and thrives in semi-arid

Mediterranean environments. http://www.sciencealert.com.au/news/20140809-26142.html?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+sciencealert-latestnews+%28ScienceAlert-Latest+Stories%29

Africa Food Shortages Blamed on Poor Soils

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FILE - Workers unload sacks of UNHCR aid supplies at the Al Adala settlement for internally displaced people in Mogadishu, Somalia, Aug.13, 20.

Mohammed Yusuf

9 September 2014 12:21 PM

NAIROBI—

A new report by the Alliance for a Green Revolution in Africa (AGRA) says that while farmers in many parts of the world regularly harvest up to five tons of maize per hectare, those in Africa harvest just one ton on average. Outdated farming practices combined with inherently low soil fertility has been blamed for the low yields.

<http://www.voanews.com/content/africa-food-shortages-blamed-on-poor-soils/2443844.html>

Pesticides are more toxic for soil organisms in dry soil and at enhanced temperatures

11 Sept 2014



Folsomia candida. Credit: C. Bandow

Soil organisms react more sensitive to marketable pesticides when exposed in dry soil and at enhanced temperatures. Both conditions may occur more often in the future due to climate change. Singularly and combined these factors lower the toxicity threshold of fungicides for springtails. The study by scientists from the LOEWE Biodiversity and Climate Research Centre (BiK-F), the Goethe University and the ECT Oekotoxikologie GmbH was published in the September issue of the journal *Applied Soil Ecology*.

Read more at: <http://phys.org/news/2014-09-pesticides-toxic-soil-temperatures.html#jCp>

Meekatharra Races back on track, thanks to new softer soils being laid

ABC Rural

By [Lucie Bell](#)



Updated Mon at 10:57am Mon 15 Sep 2014, 10:57am



Photo: [The Meekatharra race track required new soils after they were deemed 'unsuitable' for horse racing \(supplied: Meekatharra Race Club\)](#)

Preparations for the 2014 Meekatharra Bush Races, in the remote Gascoyne region of Western Australia, are back on track, literally.

The local race club discovered its red dirt track, pounded by thundering hooves for more than a

century, had become hard and unsafe for horses. <http://www.abc.net.au/news/2014-09-15/meeka-track/5741178>

What's for dinner? Rapidly identifying undescribed species in a commercial fungi packet

14 hours ago



Samples of the new species are under a microscope. Credit: Bryn Dentinger

For lovers of wild foods, autumn harks a season of bounty. Fungi of dizzying variety erupt from wood and soil, luring intrepid collectors to woodlands in search of elusive but delectable wild mushrooms. Part of their appeal lies in the allure of the treasure hunt, and their mysterious not-quite-meat, not-quite-vegetable qualities that belie an almost otherworldly existence. But are the mushrooms which you are eating known to science?

Read more at: <http://phys.org/news/2014-09-dinner-rapidly-undescribed-species-commercial.html#jCp>

Launch of online Irish soil maps

By [Margaret Donnelly](#) on 15 September 2014



Pictured are Dr. Rachel Creamer, Project Manager, Teagasc; Prof. Gerry Boyle, Director of Teagasc; Brendan Howlin, Minister for Public Expenditure and Reform and Laura Burke, Director

General, EPA at the launch.

A harmonised [soil](#) map of Ireland with an associated web-based soil information system has been launched by Teagasc and the Environmental Protection Agency (EPA).

Freely available through a public web site, the Third Edition National Soil Map details the pattern and properties of all Ireland's 213 soil types at a scale of 1:250,000. The Irish Soil Information System is the largest research project funded by the EPA, with a total budget €4.8m.

Launching the Irish Soil Information System at Johnstown Castle, Co. Wexford, Professor Gerry Boyle, Director of Teagasc, said: "The publication of the Irish Soil Information System opens a new chapter for agriculture and for our [environment](#). For the first time, after three generations of soil science, we have a complete picture of the diversity and properties of soils in Ireland. Figuratively speaking, this is equivalent to 'the initial sequencing of Ireland's soil genome'." <http://www.agriland.ie/news/launch-line-soil-maps-completes-irish-soils-jigsaw/>

Earthworms as nature's free fertilizer

12 hours ago



Earthworm presence in the soil increases crop yield, shows a new study that was published this week in Scientific Reports. "This is not unexpected," says Jan Willem van Groenigen, associate professor in the Soil Biology group of Wageningen University, and lead author of the study. "People have known for millennia that earthworms can be good for plant growth. However, we did not know how strong this effect is, nor how it works. That is what we studied."

Read more at: <http://phys.org/news/2014-09-earthworms-nature-free-fertilizer.html#jCp>

Mallee soil needs revitalising

By Graeme O'Neill

Sept. 16, 2014, 3:30 a.m.

A MAJOR report on the sandy soils of the Victorian and South Australian Mallee concludes they yield well below their potential, and suggests action to revitalise farming in the region.



MUNGBEANS: Rotations employing broadleaf crops with deep, thick tap roots, such as mungbeans could help break up hard-pan soils, according to a report by ecologist Dr Murray Unkovich.

The report, by Dr Murray Unkovich, an ecologist with the University's Adelaide's School of Agriculture, Food and Wine, says strategic research and changes to current farming practices could boost yields and revitalise farming in Victorian-SA Mallee.

<http://www.sunraysiaadaily.com.au/story/2561264/mallee-soil-needs-revitalising/?cs=12>

Wine's elements of change: soil, clones, stems and more



Grapes picked the night before wait to be processed. They are picked in a certain order so Brewer can ascertain which grapes go into which fermenter. (Anne Cusack / Los Angeles Times)

By [S. IRENE VIRBILA](#)*contact the reporter*

ColumnDining and Drinking

Some of the elements that go into creating the tone or voice of the wine, according to Melville Vineyards winemaker Greg Brewer.

The soil: Sandier soils lead to Pinot Noirs that are more feminine, with high-toned aromatics and delicacy. Clay-based soils offer more power, richness and density.

<http://www.latimes.com/food/la-fo-virbila-melville-brewer-sidebar-20140913-story.html>

Study on global carbon cycle may require reappraisal of climate events in Earth's history

Date:

16 September 2014

Source:

University of Miami Rosenstiel School of Marine & Atmospheric Science

Summary:

A recent study of the global carbon cycle offers a new perspective of Earth's climate records through time. Scientists suggest that one of the current methods for interpreting ancient changes in the concentration of carbon dioxide in the atmosphere and oceans may need to be re-evaluated.



This photo shows roots casts observed between 131-132 meters below the mud pit. These casts are situated 0.2 meters below the subaerial exposure surface (not shown). Root casts are the darker grey irregular shapes observed in the photo with round, unfilled pore spaces. Scale bar on the right are 1 cm increments.

Credit: UM Rosenstiel School of Marine and Atmospheric Science

A recent study of the global carbon cycle offers a new perspective of Earth's climate records through time. Scientists at the University of Miami (UM) Rosenstiel School of Marine and Atmospheric Science suggest that one of the current methods for interpreting

ancient changes in the concentration of carbon dioxide in the atmosphere and oceans may need to be re-evaluated.

The UM Rosenstiel School researchers measured the abundance of carbon-12 and carbon-13 isotopes in both the organic matter and carbonate sediments found in a nearly 700-meter marine sediment core from the Great Bahama Bank. The analyses showed a change to lower amounts of the rare isotope of carbon (carbon-13) in both the organic and inorganic materials as a result of several periods of sub-aerial exposure during the Pleistocene ice ages, which took place over the past two million years.

Journal Reference:

Amanda M. Oehlert, Peter K. Swart. **Interpreting carbonate and organic carbon isotope covariance in the sedimentary record.** *Nature Communications*, 2014; 5: 4672 DOI: [10.1038/ncomms5672](https://doi.org/10.1038/ncomms5672)

<http://www.sciencedaily.com/releases/2014/09/140916132521.htm>

Battle lines drawn over toxic soil dump

By Charlotte King

Two farmers are set to go head to head over a dispute involving contaminated soils in the Victorian Mallee.



Ouyen is no stranger to debates around toxic waste.

In 2004 an area just north of the town was slated by the Victorian Government to house a containment facility for toxic materials.

Back then the community fought the plan tooth and nail, with the council in Mildura investing around \$2 million towards a large-scale campaign against the dump.

In the end, the State Government's plan was shelved after an independent planning panel ruled there were too many barriers to making the project work.

But now, the subject is rearing its head again, in the form of a smaller dispute between landholders.

Related Photos



A stretch of Mallee farm land, near where a landholder is seeking to process contaminated soils on his land. (Charlotte King - ABC Local)

<http://www.abc.net.au/local/stories/2014/09/08/4083416.htm?site=milduraswanhill>

Viruses hitch ride on imported garlic

Anna Salleh
ABC

Friday, 29 August 2014

Next time you plant the garlic that's sprouted in your kitchen cupboard you could be contributing to the spread of exotic viruses, say researchers.

So suggests a new study published in *PLOS ONE*.

"Garlic can have large numbers of viruses in it and that's exactly what we found," says plant virologist Dr Steve Wylie of Murdoch University.

Garlic is particularly susceptible to plant viruses because it propagates vegetatively and does not go through a seed stage.

"The seed has got a lot of mechanisms to filter out viruses so a lot of viruses don't actually make it through the seed and it's a way of a plant cleaning itself of viruses by going through a seed stage," says Wylie.



Plant viruses brought in on imported garlic can affect local crops and native species, say researchers (Source: Copit/iStockphoto)

<http://www.abc.net.au/science/articles/2014/08/29/4075435.htm>

Boosting global corn yields depends on improving nutrient balance

Date:

16 September 2014

Source:

Purdue University

Summary:

Ensuring that corn absorbs the right balance of nitrogen, phosphorus and potassium is crucial to increasing global yields, a study finds. A review of data from more than 150 studies from the U.S. and other regions showed that high yields were linked to production systems in which corn plants took up key nutrients at specific ratios -- nitrogen and phosphorus at a ratio of 5-to-1 and nitrogen and potassium at a ratio of 1-to-1. These nutrient uptake ratios were associated with high yields regardless of the region where the corn was grown.



"The agricultural community has put a lot of emphasis on nitrogen as a means of increasing yields, but

this study highlights the greater importance of nutrient balance," said Tony Vyn, Purdue professor of agronomy.

Credit: Image courtesy of Purdue University

Ensuring that corn absorbs the right balance of nitrogen, phosphorus and potassium is crucial to increasing global yields, a Purdue and Kansas State University study finds.

A review of data from more than 150 studies from the U.S. and other regions showed that high yields were linked to production systems in which corn plants took up key nutrients at specific ratios -- nitrogen and phosphorus at a ratio of 5-to-1 and nitrogen and potassium at a ratio of 1-to-1. These nutrient uptake ratios were associated with high yields regardless of the region where the corn was grown.

"The agricultural community has put a lot of emphasis on nitrogen as a means of increasing yields, but this study highlights the greater importance of nutrient balance," said Tony Vyn, Purdue professor of agronomy. "We will not be able to continually boost global corn yields and achieve food security without providing adequate and balanced nutrients."

Journal Reference:

Ignacio A. Ciampitti, Tony J. Vyn. **Understanding Global and Historical Nutrient Use Efficiencies for Closing Maize Yield Gaps.** *Agronomy Journal*, 2014; 0 (0): 0 DOI: [10.2134/agronj14.0025](https://doi.org/10.2134/agronj14.0025)

<http://www.sciencedaily.com/releases/2014/09/140916182220.htm>

Carbon injection initiative supported by new research

12 hours ago by Euan Wemyss



Carbon dioxide is absorbed by basalt lava rock

Worldwide attempts to tackle global warming by injecting carbon dioxide into underground volcanic rock have been informed by new research that shows the process happens naturally

on a massive scale over millions of years.

Read more at: <http://phys.org/news/2014-09-carbon.html#jCp>

Celebrating 50 years of ABC Science

To celebrate the 50th anniversary of ABC Science, we've put together this short clip of some of the highlights.



The ABC Science Unit began with radio at a time when television was still in black and white and was yet to arrive everywhere in regional Australia.

There was no such thing as satellite broadcasting or personal computers or, (can you imagine), the internet. Perhaps that is why so many in the baby boomer generation still fondly remember Julius Sumner Miller's *Why is it so?*

<http://www.abc.net.au/science/articles/2014/09/01/4076259.htm>

Multiple studies provide insight into drought tolerance of TAM wheat varieties

15 Sep 2014 by Kay Ledbetter



Dr. Qingwu Xue, a Texas A&M AgriLife Research crop stress physiologist in Amarillo, checks a wireless

infrared thermometer in a wheat field. Credit: Kirk Jessup

Drought is the most important constraint limiting wheat yields in the U.S. Southern High Plains, and the past four years of exceptional drought have provided a tremendous opportunity for research and genetic improvements.

Read more at: <http://phys.org/news/2014-09-multiple-insight-drought-tolerance-tam.html#jCp>

Drought hits Brazil coffee harvest

5 hours ago



Workers select arabic coffee beans at a farm near Varginha, Brazil, on September 23, 2003

Coffee output in Brazil, the world's chief exporter, will slide this year after the worst drought in decades, agricultural agency Conab said Tuesday.

Read more at: <http://phys.org/news/2014-09-drought-brazil-coffee-harvest.html#jCp>

Impact that doomed the dinosaurs helped the forests bloom

Date:

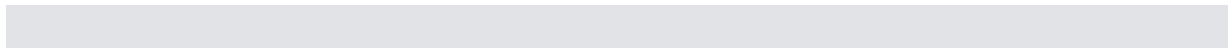
16 September 2014

Source:

PLOS

Summary:

Some 66 million years ago, a 10-km diameter chunk of rock hit the Yucatan peninsula with the force of 100 teratons of TNT. It left a crater more than 150 km across, and the resulting megatsunami, wildfires, global earthquakes and volcanism are widely accepted to have wiped out the dinosaurs and made way for the rise of the mammals. But what happened to the plants on which the dinosaurs fed?



Some 66 million years ago, a 10-km diameter chunk of rock hit the Yukatan peninsula near the site of the small town of Chicxulub with the force of 100 teratons of TNT. It left a crater more than 150 km across, and the resulting megatsunami, wildfires, global earthquakes and volcanism are widely accepted to have wiped out the dinosaurs and made way for the rise of the mammals. But what happened to the plants on which the dinosaurs fed?

A new study led by researchers from the University of Arizona reveals that the impact that spelled doom for the dinosaurs also decimated the evergreen flowering plants to a much greater extent than their deciduous peers. They hypothesize that the properties of deciduous plants made them better able to respond rapidly to chaotically varying post-apocalyptic climate conditions. The results are publishing on September 16 in the open access journal *PLOS Biology*.

Journal Reference:

Benjamin Blonder, Dana L. Royer, Kirk R. Johnson, Ian Miller, Brian J. Enquist. **Plant Ecological Strategies Shift Across the Cretaceous–Paleogene Boundary**. *PLoS Biology*, 2014; 12 (9): e1001949 DOI: [10.1371/journal.pbio.1001949](https://doi.org/10.1371/journal.pbio.1001949)

<http://www.sciencedaily.com/releases/2014/09/140916141529.htm>

Scottish people most sceptical on fracking, survey shows

10 hours ago

If Scotland votes for independence later this week, its Government could face an uphill challenge in persuading the Scottish people that fracking is necessary, research has revealed.

Read more at: <http://phys.org/news/2014-09-scottish-people-sceptical-fracking-survey.html#jCp>

Long lost Roman fort discovered in Gernsheim

12 hours ago



In the course of an educational dig in Gernsheim in the Hessian Ried, archaeologists from Frankfurt University have discovered a long lost Roman fort: A troop unit made up out of approximately 500 soldiers (known as a cohort) was stationed there between 70/80 and 110/120 AD. Over the past weeks, the archaeologists found two V-shaped ditches, typical of this type of fort, and the post holes of a wooden defensive tower as well as other evidence from the time after the fort was abandoned.

Read more at: <http://phys.org/news/2014-09-lost-roman-fort-germsheim.html#jCp>

Companies are realizing that sustainability issues are here to stay

Sep 15, 2014 by M.e. Malone

Prefer farmers markets to supermarket chains? Organic Vermont goat cheese to Velveeta? Then there's a market segment with a hip acronym just for you: LOHAS, or people livin' a Lifestyle of Health and Sustainability.

Read more at: <http://phys.org/news/2014-09-companies-sustainability-issues.html#jCp>

New digital map reveals stunning hidden archaeology of Stonehenge

Date:

September 9, 2014

Source:

University of Birmingham

Summary:

A host of previously unknown archaeological monuments have been discovered around Stonehenge

as part of an unprecedented digital mapping project that will transform our knowledge of this iconic landscape -- including remarkable new findings on the world's largest 'super henge,' Durrington Walls.

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Stonehenge. A host of previously unknown archaeological monuments have been discovered around Stonehenge as part of an unprecedented digital mapping project that will transform our knowledge of this iconic landscape -- including remarkable new findings on the world's largest 'super henge', Durrington Walls.

Credit: Image courtesy of University of Birmingham

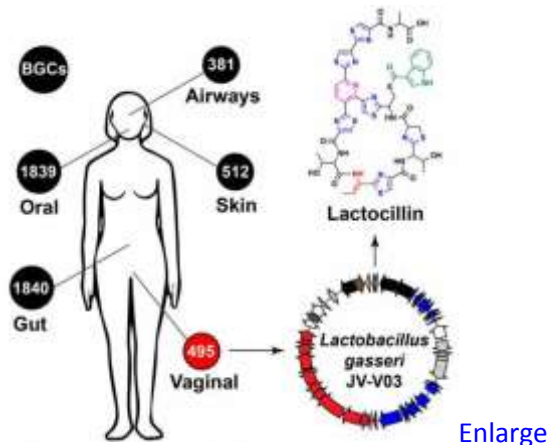
A host of previously unknown archaeological monuments have been discovered around Stonehenge as part of an unprecedented digital mapping project that will transform our knowledge of this iconic landscape -- including remarkable new findings on the world's largest 'super henge', Durrington Walls.

The Stonehenge Hidden Landscapes Project, led by the University of Birmingham in conjunction with the Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology, is the largest project of its kind.

<http://www.sciencedaily.com/releases/2014/09/140909192134.htm>

Our microbes are a rich source of drugs, researchers discover

11 Sept 2014



A scientific team led by UCSF microbiome expert Michael Fischbach, PhD, identified more than 3,000 clusters of bacterial genes at different body sites that contain the blueprints for cellular factories that make drug-like molecules. One of ...[more](#)

Bacteria that normally live in and upon us have genetic blueprints that enable them to make thousands of molecules that act like drugs, and some of these molecules might serve as the basis for new human therapeutics, according to UC San Francisco researchers who report their new discoveries in the September 11, 2014 issue of *Cell*.

Read more at: <http://phys.org/news/2014-09-microbes-rich-source-drugs.html#jCp>

Reducing pesticides, adding sound vibrations and boosting harvests

Date:

16 September 2014

Source:

youris.com

Summary:

Scientists are experimenting with sound vibrations to replace pesticides. Adapting different eco-friendly methods they are able to boost harvests and open up a new chapter in sustainable farming.

Scientists in Italy are experimenting with sound vibrations to replace pesticides. Adapting different eco-friendly methods they are able to boost harvests and open up a new chapter in sustainable farming.

Scientists in Northern Italy are experimenting with unusual and totally eco-friendly sound and odor devices to fight off insects from their cultivated fields. And their studies suggest that these methods could be as efficient in protecting crops as using chemical based pesticides. In the meantime, in a field study near Pisa, Italy, researchers are learning how important it is to keep semi-natural habitats next to cultivated fields. These areas are an important resource for pollinators and it now seems they even have an impact on the yield of the cultivated crops.

<http://www.sciencedaily.com/releases/2014/09/140916122938.htm>