



# CoP

# Land and Soil Management Community of Practice



## Save Our Soils: fight to halt land losses

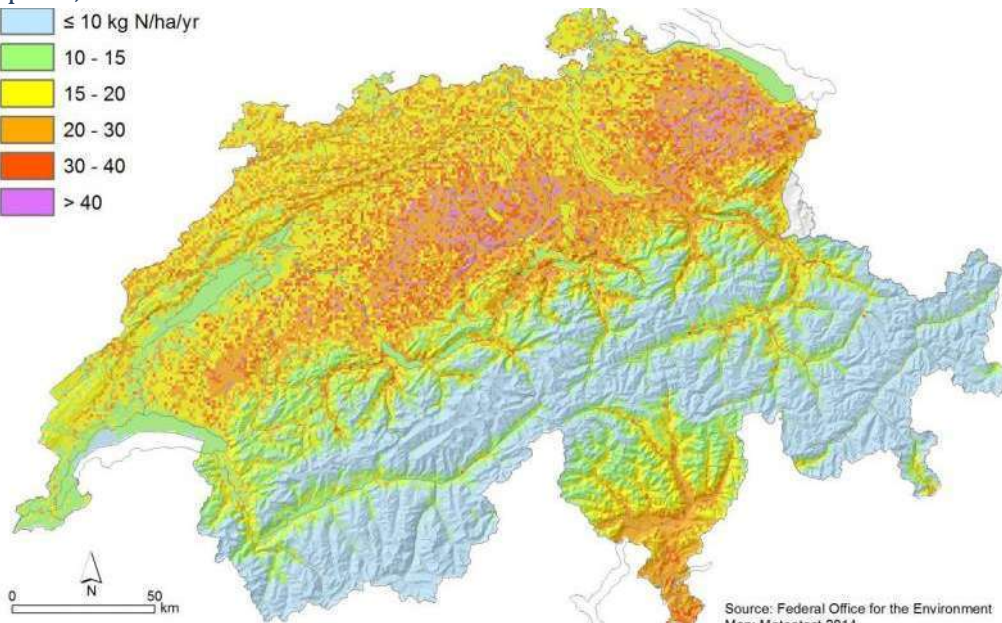
The Save Our Soils campaign, founded by organic fruit specialist Eosta and 150 global partners including the UN, has announced that it is almost halfway towards its fundraising target to help farmers save millions of hectares of threatened land. Eosta, operating under its brand name Nature & More, together with its partners in the Save Our Soils campaign, has established a fund that will support farmers across the globe in saving fertile soils.

<http://www.freshplaza.com/article/137751/Save-Our-Soils-fight-to-halt-land-losses>



## Nitrogen deposition reduces swiss plant diversity

Apr 08, 2015



Source: Federal Office for the Environment  
Map: March 2014

Emissions produced in agriculture are responsible for two thirds of the nitrogen deposition in Switzerland. Nitrogen oxides produced by burning of fossil fuels are responsible for the other third.

High human atmospheric nitrogen emissions lead to a reduction of plant diversity. Researchers at the University of Basel analyzed plots all over Switzerland and report that the

plant diversity has decreased in landscapes with high nitrogen deposition. The journal Royal Society Open Science has published their results.

Read more at: <http://phys.org/news/2015-04-nitrogen-deposition-swiss-diversity.html#jCp>

## Soil organic matter susceptible to climate change

Soil organic matter, long thought to be a semi-permanent storehouse for ancient carbon, may be much more vulnerable to climate change than previously thought. Scientists have found that the common root secretion, oxalic acid, can promote soil carbon loss by an unconventional mechanism -- freeing organic compounds from protective associations with minerals.



Researchers sample soil at the Pendleton Research Station (Columbia Basin Agricultural Research Center, OSU). Marco Keiluweit of Oregon State University (in the pit) takes soil samples and is assisted by collaborators Jeremy Bougoure and Jennifer Pett-Ridge of Lawrence Livermore National Laboratory.

*Credit: Markus Kleber*

[\[Click to enlarge image\]](#)

Soil organic matter, long thought to be a semi-permanent storehouse for ancient carbon, may be much more vulnerable to climate change than previously thought.

### Journal Reference:

1. Marco Keiluweit, Jeremy J. Bougoure, Peter S. Nico, Jennifer Pett-Ridge, Peter K. Weber, Markus Kleber. **Mineral protection of soil carbon counteracted by root exudates.** *Nature Climate Change*, 2015; DOI: [10.1038/nclimate2580](https://doi.org/10.1038/nclimate2580)

# CSIRO trials no tillage farming to make water repellent soils more productive

SA Country Hour **Brooke Neindorf**

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Updated 6 Mar 2015, 3:22pm

## Water repellent soils are not something you want to see if you are trying to grow a crop.

This is why the Australia's national science agency the CSIRO, has been doing trials, funded by the Grains Research and Development Corporation (GRDC), to try and make these soils more productive for farmers.

Margaret Roper is a principal research scientist at the CSIRO and has been working on water repellent soils for nearly 25 years.

She said new trials are being set up on South Australia's Eyre Peninsula because there are a lot of soils that do not soak in water.

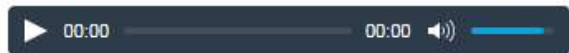
"There is a lot of sand and water repellency is associated with sands and it is caused by waxes which come from plant material and particularly if you are cropping a soil," she said.

"When those plants die and they lie on the soil,



**PHOTO:** The CSIRO has been trialling how water can get through repellent soils using old root pathways. The blue dye shows where the water has gone down into the old roots. (Margaret Roper (CSIRO))

**MAP:** Port Lincoln 5606



**AUDIO:** CSIRO principal research scientist Margaret Roper talks about the trials they are doing with water repellent soils

<http://www.abc.net.au/news/2015-03-05/csiro-trials-new-ways-to-make-water-repellent-soils-productive/6281930>

## Hormones that guide root growth rates revealed

15 hours ago



Excavated root system of an Eastern Gamagrass plant. Credit: Keith Weller, Ag Research Magazine, provided courtesy of the USDA Agricultural Research Service

A plant's roots grow and spread into the soil, taking up necessary water and minerals. The tip of a plant's root is a place of active cell division followed by cell elongation, with different zones dedicated to different functions, all working together to expand into new depths of the soil. Achieving an optimal root growth rate is critical for plant survival under drought conditions, as well as for maximizing resource allocation to the important plant parts such as the fruits and seeds. This is why root-expansion mechanisms are of great interest to scientists and to those interested in improving agricultural yields.

Read more at: <http://phys.org/news/2015-04-hormones-root-growth-revealed.html#jCp>

## **Volcanic soils produce unique wines**

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Volcanic soil produces top-quality wines with rich flavours and aromas, writes Daniel Scheffler



In Sicily, on the slopes of Mount Edna, among volcanic soil and high altitude lies Italy's most interesting wines.

The essence of wine is romance. Apart from its ancient roots, it is the visceral production process and that deep enjoyment of the final product that lend it its ardour and mystique. Most of us are familiar with the long trusted wine regions of the world - Bordeaux, Napa Valley, Stellenbosch - but lesser known are the small groups of vintners rediscovering alternative fountainheads to wine creation, such as vineyards located in regions known primarily for their volcanic activity.

<http://www.scmp.com/magazines/style/article/1723887/volcanic-soils-produce-unique-wines>

## Ferromanganese crusts record past climates

16 hours ago



Ferromanganese crusts with typical band structure. Credit: Source: Buczkowski, USGS.

The onset of northern hemispheric glaciation cycles three million years ago has dramatically changed Arctic climate. Scientists of the GEOMAR Helmholtz Centre for Ocean Research Kiel, Germany have now for the first time reconstructed the history of Arctic climate based on records archived in ferromanganese crusts. The study, a collaboration with the United States Geological Survey and the Swiss Federal Institute of Technology Zurich, has now been published in the journal *Earth and Planetary Science Letters*.

Read more at: <http://phys.org/news/2015-04-ferromanganese-crusts-climates.html#jCp>

# Climate change, plant roots may accelerate carbon loss from soils

Soil, long thought to be a semi-permanent storehouse for ancient carbon, may be releasing carbon dioxide to the atmosphere faster than anyone thought. In a new study, researchers showed that chemicals emitted by plant roots act on carbon that is bonded to minerals in the soil, breaking the bonds and exposing previously protected carbon to decomposition by microbes.



Markus Kleber is a soil scientist at Oregon State University.

Credit: Tiffany Woods

Soil, long thought to be a semi-permanent storehouse for ancient carbon, may be releasing carbon dioxide to the atmosphere faster than anyone thought, according to Oregon State University soil scientists.

In a study published in this week's online edition of the journal *Nature Climate Change*, the researchers showed that chemicals emitted by plant roots act on carbon that is bonded to minerals in the soil, breaking the bonds and exposing previously protected carbon to decomposition by microbes.

## Journal Reference:

1. Marco Keiluweit, Jeremy J. Bougoure, Peter S. Nico, Jennifer Pett-Ridge, Peter K. Weber, Markus Kleber. **Mineral protection of soil carbon counteracted by root exudates**. *Nature Climate Change*, 2015; DOI: [10.1038/nclimate2580](https://doi.org/10.1038/nclimate2580)

<http://www.sciencedaily.com/releases/2015/04/150406165527.htm>

## Soil myths and facts for improving soils



Zoom

CONTRIBUTED PHOTO Prince George Greater Tomato Contest Winners Announced Pictured (left to right): Mia Aahlee Whitlock and Scott Reiter (Prince George Extension agent)

By Scott Reiter

Posted Mar, 9, 2015 at 1:01 AM

Being a county Extension agent, I receive numerous questions throughout the year about improving soils. Many of the questions revolve around old wives tales and myths that have been told over many years. Here are a few common misconceptions and some ways to deal with your particular issue.

- Pine needles and oak leaves acidify the soil. Myth. While pine needles and some leaves have an acid pH they do not cause a great change in soil pH. Pine needles are somewhat acidic while still green. After they have dried or started to decompose, the acidity is leached from the needles. The acidity from the needles and leaves is not great enough to really change our soil pH levels. The soils in our region are naturally acidic due to the mineral content and chemistry of the

soil. Most soils stabilize at pH levels from 5.0 to 5.5 with no lime additions. We generally do not need to lower soil pH for most acid loving plants. However, liming is essential for growing plants that need a soil pH above 6.0. Lime requirements should be determined with a soil test every 2-3 years.

<http://www.progress-index.com/article/20150309/NEWS/150309694/2002/LIFESTYLE>

## Scientists predict gradual, prolonged permafrost greenhouse gas emissions

8 Apr 2015



Permafrost peatbog border. Storflaket, Abisko, Sweden. Credit: Dentren/Wikipedia

A new scientific synthesis suggests a gradual, prolonged release of greenhouse gases from permafrost soils in Arctic and sub-Arctic regions, which may afford society more time to adapt to environmental changes, say scientists in an 9 April paper published in *Nature*.

Read more at: <http://phys.org/news/2015-04-scientists-gradual-prolonged-permafrost-greenhouse.html#jCp>

## Producing strawberries in high-pH soil at high elevations

Scientists designed an experiment with 16 strawberry cultivars planted in two perennial planting systems in New Mexico. The experiments evaluated strawberry tolerance to high-pH soil, and determined yield potential in high-pH soil of the high-elevation areas in the US Southwest. Results indicated that growers can produce certain varieties of strawberries in the challenging conditions. The study contains recommendations regarding the most tolerant strawberry cultivars for the conditions and region.



Strawberries were grown in New Mexico in experiments that determined 16 varieties of strawberries' suitability as potential alternative crops for high elevation, high pH soil conditions.

*Credit: Shengrui Yao*

[\[Click to enlarge image\]](#)

Fruit and vegetable production in high-elevation areas can be a difficult enterprise. Variable weather and soil conditions typical of these regions, such as the southwestern United States, present multiple challenges for growers. "High frequency and intensity of late spring frosts in semiarid climates have made fruit production challenging," explained Shengrui Yao, corresponding author of a study in the February 2015 issue of *HortScience*. "Growers may only harvest five to six apple crops during a 10-year period, and, as a result, many are forced to abandon their orchards." To lessen the negative impacts of unreliable weather and soil conditions, growers in the region are looking to alternative crops to help them stay in business. Yao and researchers Steve Guldan, Robert Flynn, and Carlos Ochoa studied multiple strawberry varieties, and found some promising options for growers in the U.S. Southwest.

### Journal Reference:

1. Shengrui Yao and Steve Guldan. **Challenges of Strawberry Production in High-pH Soil at High Elevation in the Southwestern United States.** *HortScience*, February 2015

<http://www.sciencedaily.com/releases/2015/04/150406121446.htm>



# Diggin' it: Let's celebrate our soil

Print Email ☆

March 07, 2015 11:30 pm • By Kathryn Cates Moore | Lincoln Journal Star

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It is officially the year to give what's beneath our feet the attention it deserves. The "international year of soil," as proclaimed by the Food and Agriculture Organization of the United Nations, has begun.

Getting the dirt on dirt is complex. In fact, you might say it is clear as mud. What's in our playgrounds, under our fingernails and the anchor for our fields, isn't a simple mix. According to the book "Compost" by Clare Foster (Mitchell Beazley), soil comprises four main components: rock or mineral particles, organic matter, air and water. Of the solid matter, the rock and mineral content is 90 percent, and the organic matter is a mere 10 percent.

And our soil is chemically active, according to Timothy Kettler, a professor of agronomy at the University of Nebraska-Lincoln.

Raising awareness of this finite resource is well-deserved, Kettler said. "It is often taken for granted and not appreciated for what it provides." He stresses soil is not something that is available in an unlimited quantity.



Enlarge Photo

[http://journalstar.com/lifestyles/home-and-garden/diggin-it-let-s-celebrate-our-soil/article\\_0baf7960-44fe-5edc-bea5-b89cb7c67567.html](http://journalstar.com/lifestyles/home-and-garden/diggin-it-let-s-celebrate-our-soil/article_0baf7960-44fe-5edc-bea5-b89cb7c67567.html)

## NASA image: Fires in Western Australia April 2015

12 hours ago



This natural-color satellite image was collected by the Moderate Resolution Imaging Spectroradiometer (MODIS) aboard the Aqua satellite on April 09, 2015. Actively burning areas, detected by MODIS's thermal bands, are outlined in red. Credit: [...more](#)

Bushfires are inevitable in the fire-prone landscapes of Western Australia. Long dry summers, vegetation and undergrowth, and ignition from lightning or human causes mean that bushfires can and do occur every summer.

Read more at: <http://phys.org/news/2015-04-nasa-image-western-australia-april.html#jCp>

## Soil experts recommend cover-cropping

**Planting secondary "cover" crop between primary crop helps maintain soil quality, prevent erosion, experts say in workshop**

**Posted:** March 6, 2015 - 9:44pm | **Updated:** 7 March 2015 - 1:25am

By [JOSIE MUSICO](#)

A-J MEDIA

Cotton harvest is over, and planting time for next season is months away.

What should you do with your empty fields?

Consider cover-cropping, say many soil experts. In contrast with a primary crop that's raised for harvest and then sold for a profit, a secondary "cover" crop is planted mainly for soil protection. <http://lubbockonline.com/local-news/2015-03-06/soil-experts-recommend-cover-cropping>



## Dry Soils Exacerbated 2006 Heatwave in Northern France

05 March 2015

**FRANCE** - New areas of land suitable for agriculture will open up under climate change's effects, new research predicts, particularly in far northern regions of the world. However, the overall quality of land for farming will decline and many regions, including Europe, could lose large areas of suitable land.

Demand for agricultural products is expected to rise by 70–110 per cent by 2050. This is driven by population growth, increased meat consumption and greater use of biofuels and bio-based materials, such as bioplastics, reports Science for Environment Policy.

<http://www.thecropsite.com/news/17389/dry-soils-exacerbated-2006-heatwave-in-northern-france/>

## Diversity and Abundance of Arsenic Biotransformation Genes in Paddy Soils from Southern China

Si-Yu Zhang,<sup>†,‡</sup> Fang-Jie Zhao,<sup>§,||</sup> Guo-Xin Sun,<sup>†</sup> Jian-Qiang Su,<sup>#</sup> Xiao-Ru Yang,<sup>#</sup> Hu Li,<sup>#</sup> and Yong-Guan Zhu<sup>\*,†,‡,#</sup>

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<sup>‡</sup>University of Chinese Academy of Sciences, Beijing 100049, People's Republic of China

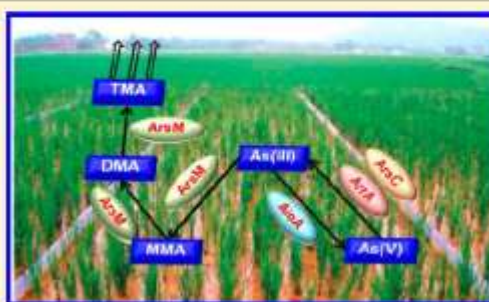
<sup>§</sup>Jiangsu Collaborative Innovation Center for Solid Organic Waste Resource Utilization, College of Resources and Environmental Sciences, Nanjing Agricultural University, Nanjing 210095, People's Republic of China

<sup>||</sup>Sustainable Soil and Grassland Systems Department, Rothamsted Research, Harpenden, Hertfordshire AL5 2JQ, U.K.

<sup>\*</sup>Key Laboratory of Urban Environment and Health, Institute of Urban Environment, Chinese Academy of Sciences, Xiamen 361021, People's Republic of China

### Supporting Information

**ABSTRACT:** Microbe-mediated arsenic (As) biotransformation in paddy soils determines the fate of As in soils and its availability to rice plants, yet little is known about the microbial communities involved in As biotransformation. Here, we revealed wide distribution, high diversity, and abundance of arsenite (As(III)) oxidase genes (*aoxA*), respiratory arsenate (As(V)) reductase genes (*arrA*), As(V) reductase genes (*arsC*), and As(III) S-adenosylmethionine methyltransferase genes (*arsM*) in 13 paddy soils collected across Southern China. Sequences grouped with As biotransformation genes are mainly from rice rhizosphere bacteria, such as some *Proteobacteria*, *Gemmatimonadales*, and *Firmicutes*. A significant correlation of gene abundance between *arsC* and *arsM* suggests that the two genes coexist well in the microbial As resistance system. Redundancy analysis (RDA)



<http://pubs.acs.org/doi/pdfplus/10.1021/acs.est.5b00028>

### Agenda

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June 26-27, 2015

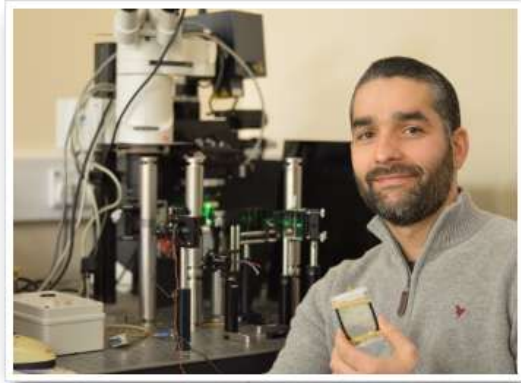
Celebrating Soil! Celebrating Life!

From June 26th - 27th, the UN International Year of Soils will be celebrated in the Netherlands in an international conference, with prominent international guests and keynote speakers.



<http://www.saveoursoils.com/agenda/132/june-26-29-2015.html>

## Prestigious European grant for artificial soils research



*"Using innovative approaches Lionel is shining a light on the ways that plant roots gather nutrients and water. Ultimately, his insights and findings will help address pressing challenge of feeding the world and saving the planet."*



A James Hutton Institute scientist has been awarded a highly prestigious European Research Council (ERC) Consolidator Grant to undertake research on a new generation of artificial soils; it is hoped that this would allow researchers to better study the interaction of roots, soil and the microorganisms that live in it – a key battleground in the ongoing fight for food security.

<http://www.hutton.ac.uk/news/prestigious-european-grant-artificial-soils-research>

## Greatest mass extinction driven by acidic oceans, study finds

13 hours ago



Field work in the United Arab Emirates. Credit: D.Astratti

Changes to the Earth's oceans, caused by extreme volcanic activity, triggered the greatest extinction of all time, a study suggests.

Read more at: <http://phys.org/news/2015-04-greatest-mass-extinction-driven-acidic.html#jCp>

# Biochar culture to address depleted soils, improve crop yields

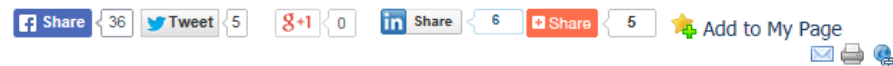
**Biochar, a carbon-rich organic farm product, which is obtained through high temperature treatment of locally available plant charcoal blended with low quantities of inorganic elements**

N Madhav | Hyderabad April 3, 2015 Last Updated at 20:41 IST

## Farm Performance Software

Farmbook Management Software. For paddocks, livestock & crops [practicalsystems.com.au/Farmbook](http://practicalsystems.com.au/Farmbook)

Ads by Google



## RELATED NEWS

- MP govt invites private players for organic farming
- Block printing, charcoal art and C-grade cinema to enliven the weekend
- Organic cotton textile park in

Biochar, a carbon-rich organic farm product, which is obtained through high temperature treatment of locally available plant charcoal blended with low quantities of inorganic elements, could help repair and rejuvenate the depleted agriculture soils, and also raise crop yields in the country, according to the International Biochar initiative.

[http://www.business-standard.com/article/current-affairs/biochar-culture-to-address-depleted-soils-improve-crop-yields-115040300900\\_1.html](http://www.business-standard.com/article/current-affairs/biochar-culture-to-address-depleted-soils-improve-crop-yields-115040300900_1.html)

# Panama debate fueled by zircon dating: Americas connected earlier than thought

9 hours ago



After the Isthmus of Panama formed, animals and plants could move back and forth between continents, the Great American Biological Interchange. Smithsonian scientists are debating when this happened. Credit: Smithsonian Tropical Research Institute

New evidence published in *Science* by Smithsonian geologists dates the closure of an ancient seaway at 13 to 15 million years ago and challenges accepted theories about the rise of the Isthmus of Panama and its impact on world climate and animal migrations.

Read more at: <http://phys.org/news/2015-04-smithsonian-panama-debate-fueled-zircon.html#jCp>

# Scientist uses special fertilizer to keep palms, soil and water healthy

8 Apr 2015 by Brad Buck

A University of Florida scientist has developed a fertilizer for palm trees that should keep them healthy and reduce water pollution.

Read more at: <http://phys.org/news/2015-04-scientist-special-fertilizer-palms-soil.html#jCp>



**“Doctor Who: You want weapons? We're in a library. Books are the best weapon in the world. This room's the greatest arsenal we could have. Arm yourself!”**

(from Tooth and Claw in Season 2)”

— [Russell T. Davies](#)