

Hi All,

After 3 glorious months of leave the need to pay bills has dictated that I returned to work.

Hope you enjoy this CoP edition.

Regards

Brian

Life in Earth's soils may be older than believed

Date:

17 November 2016

Source:

University of Oregon

Summary:

Advanced imaging and analyses techniques have opened a new window into microfossils of ancient landscapes in Australia, scientists report.



Karijini National Park, Australia. The ancient soils from Australia's Pilbara region (west of Karijini National Park) are similar to those found recently by the Mars rover Curiosity.

Way before trees or lichens evolved, soils on Earth were alive, as revealed by a close examination of microfossils in the desert of northwestern Australia, reports a team of University of Oregon researchers.

These tiny fossils require a microscope to see and probably represent whole organisms. The 3,000 million-year-old Australian rocks have long been thought to be of marine origin. However, "a closer look at the dusty salt minerals of the rocks suggests they had to have experienced evaporation on land," said UO paleontologist Gregory Retallack, lead author on a study in the December issue of the international journal *Gondwana Research*.

Other mineral and chemical tracers found in the rocks also required weathering in soils of the distant geological past, he said.

Journal Reference:

1. Gregory J. Retallack, David H. Krinsley, Robert Fischer, Joshua J. Razink, Kurt A. Langworthy. **Archean coastal-plain paleosols and life on land.** *Gondwana Research*, 2016; 40: 1 DOI: [10.1016/j.gr.2016.08.003](https://doi.org/10.1016/j.gr.2016.08.003)
<https://www.sciencedaily.com/releases/2016/11/161117150229.htm>

Adelaide Plains see light of day after 30 plus years of gestation!

Greg Bowman

Adelaide Plains soil catena study which has just seen the light of day after 30 plus years of gestation!

The original 3 volume Adelaide soils and stratigraphy report and other papers were published in the 90's, when we effectively finished the project and after I was transferred to Canberra, but this aspect was a bit specialised so it was left until Malcolm Sheard was about to retire. It's a bit idiosyncratic but quite a detailed study of a complex soil distribution pattern

<https://sarigbasis.pir.sa.gov.au/WebtopEw/ws/samref/sarig1/image/DDD/RB201500028.pdf>

Regenerative grazing improves soil health and plant biodiversity

28 November 2016



LIFE Regen Farming. Credit: Elhuyar Fundazioa

Regenerative practices improve soil quality and pasture diversity, as the European LIFE Regen Farming project, due to end this year, has shown. The last few decades have seen the gradual abandoning of grazing practices in many livestock systems, as the problems of sustainability have become increasingly clear. Likewise, the growing environmental concern and the need to produce quality food in a sustainable, environmentally friendly way are shaping the agri-food sector as a key sector. The LIFE Regen Farming project, developed under these premises, seeks to determine the viability of regenerative practices as an alternative for the sustainability of livestock farms. <http://phys.org/news/2016-11-regenerative-grazing-soil-health-biodiversity.html>

Is Soil our Secret Weapon Against Climate Change?

Marco Marzano de Marinis, Secretary General of the World Farmers' Organisation (WFO).

What if one of the planet's secret weapons in the fight against climate change was all around us?

What if every country had it in abundance, and it could also be used at the same time to give a better life to those most in need?

Too good to be true?

http://www.huffingtonpost.com/marco-marzano-de-marinis/is-soil-our-secret-weapon_b_12909828.html

Outback WA soils similar to those on planet Mars says scientist

ABC North West WA

By [Jasmine Bamford](#)

Updated Wed at 5:51pm Wed 23 Nov 2016, 5:51pm



Photo: Fossils of life forms from 3 billion years ago have been discovered in soils from WA's East Pilbara. ([ABC Rural: Eliza Wood](#))

Researchers have hailed a remarkable scientific discovery in the Pilbara region of Western Australia that may be useful as a guide to the discovery of other planets.

A team led by University of Oregon palaeontologist Gregory Retallack has found tiny fossils, estimated at 3 billion years old, near the former mining town of Goldsworthy in the state's north-west.

Dr Retallack said the fossils, which require a microscope to see, are superficially similar to those found by NASA's Curiosity Rover on Mars.

<http://www.abc.net.au/news/2016-11-23/outback-wa-soils-similar-to-those-on-planet-mars-says-geologist/8051510>

Mt Kenya soils could kill bacteria strains

12 Nov 2016, 5:00 am

By JOHN MUCHANGI, [@jomunji](#)



DAAD German Academic Exchange Service Africa branch director Helmut Blumbach and Nairobi Lab team leader Ryan Awori at the award ceremony /JOHN MUCHANGI

The rich volcanic soils around Mt Kenya could help the world stop the rise of superbugs, the strains of bacteria that have become resistant to most antibiotics commonly used today.

Four Kenyan scientists say the soils contain insect-killing roundworms from which they extracted compounds six times more powerful than the two best antibiotics used

today. They developed a drug candidate known as Mursamacin. “This may herald novel and new potential medicines for treatment of the world’s most prevalent antibiotic resistant bacteria,” team leader Ryan Awori said on Thursday.

http://www.the-star.co.ke/news/2016/11/12/mt-kenya-soils-could-kill-bacteria-strains_c1454120

Soils committee moves to have agricultural soils lose modifiers

12 November 2016

The Cavalier County Soils Committee has been hard at work this past year trying to find a solution to the dilemma of inaccurate tax values that are currently in place for many agricultural soil parcels.



By Melissa Anderson

The soils committee, led by Cavalier County Tax Director Pam Lafrenz recently put forward a recommendation to the Cavalier County Commission to completely remove all soil modifiers on agricultural parcels and start from scratch.

The committee also has been looking at lowering the soils productivity index which would bring more parcels into taxable value range.

The Soil Productivity index (PI's) is a rating that comes

<http://www.cavaliercountyextra.com/2016/11/12/soils-committee-moves-to-have-agricultural-soils-lose-modifiers/>

Dust activity	Some minor dust in the south west
Wind strength	Windiest October since 2005
Groundcover	Good but dropping in the west
Rainfall	Average to slightly above average
Land management	Spring fallowing and sowing

Dust activity

There was little dust activity in October 2016 (Figure 1). This is expected due to the excellent current groundcover across southern Australia (Figure 2). Most Natural Resource Management areas within the DustWatch network are still close to 100% of their area above 50% groundcover (Table 1).

Dust was observed at Lameroo and Walpeup on 30 October. This event was associated with very strong westerly winds (>50km/h). Only a very small proportion of the Mallee (<1%) was below 50% groundcover; however, bare paddocks upwind of the Walpeup site are clearly visible on the MODIS image (red circle in Figure 2). This bare soil could be avoided by using chemical fallowing. Dust was also detected on that day in Moree. Wind speeds were not as strong as in Walpeup and winds were from the north. Bare paddocks ready for cotton sowing were the likely source.

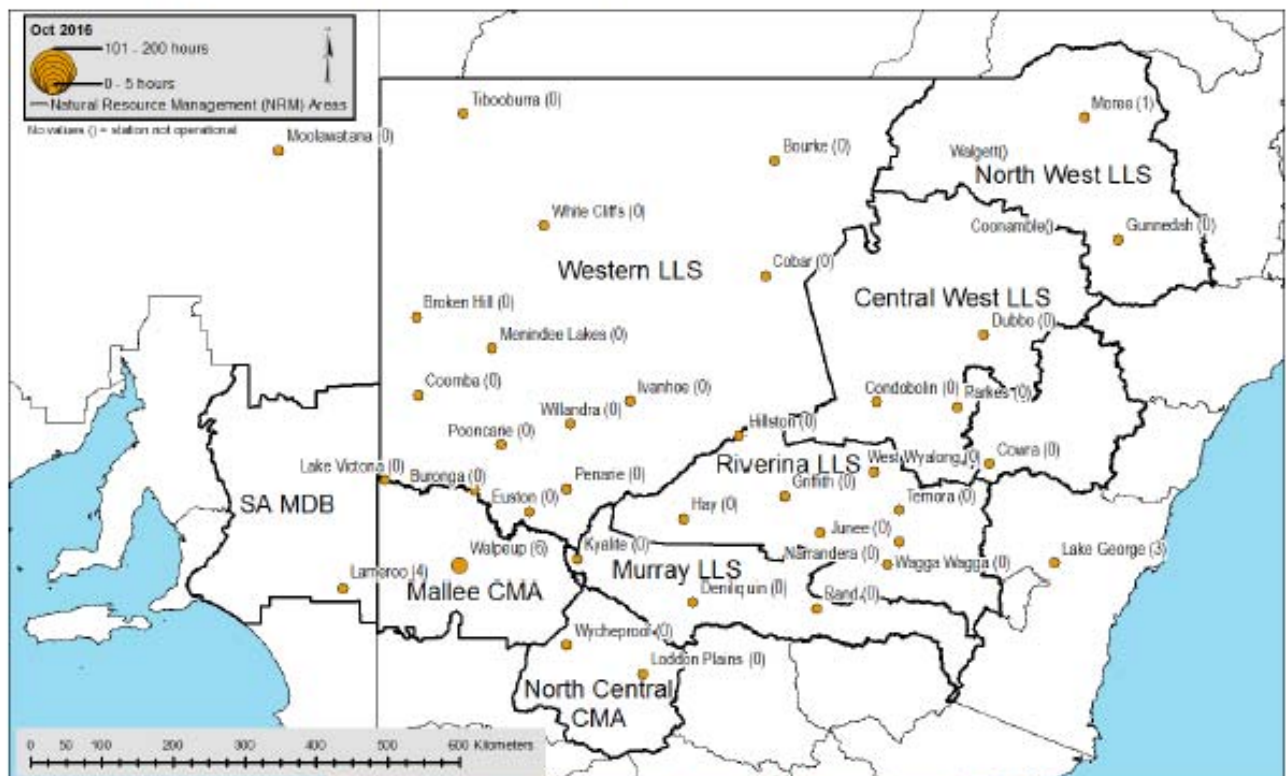


Figure 1: Hours of dust activity (number in brackets) at each DustWatch site in October 2016

Read all the details in the latest [DustWatch Report](#).

To look at the dust data yourself - check out the DustWatch Data Explorer:

<http://www.environment.nsw.gov.au/dustwatchapp/Default.aspx>

Protecting your precious soils

Friday, 11 November 2016, 10:13 am

Press Release: Bala TikkiSETTY Waikato Regional Council

Bala TikkiSETTY

A sound understanding of soil characteristics is an essential component of effective farming, especially at a time when there is an increased focus on limiting the impacts of land use on water quality.

Knowing soil conditions and how they vary during the year can help to deliver very practical benefits, including maximising production through efficient utilisation of nutrients in animal effluent and preventing contamination of ground water and waterways.

I find farmers are taking an increasing interest in understanding their soils more to help them manage their business and the environment better.

<http://www.scoop.co.nz/stories/CU1611/S00156/protecting-your-precious-soils.htm>

NQ Dry Tropics to host soil health workshops

8 Nov 2016, 11:55 a.m.



Graziers will discover what makes soil healthy, how to tell if it's alive, how to re-energise it, and how to make positive changes for their business at an upcoming series of NQ Dry Tropics workshops from 21 to 25 November 2016.

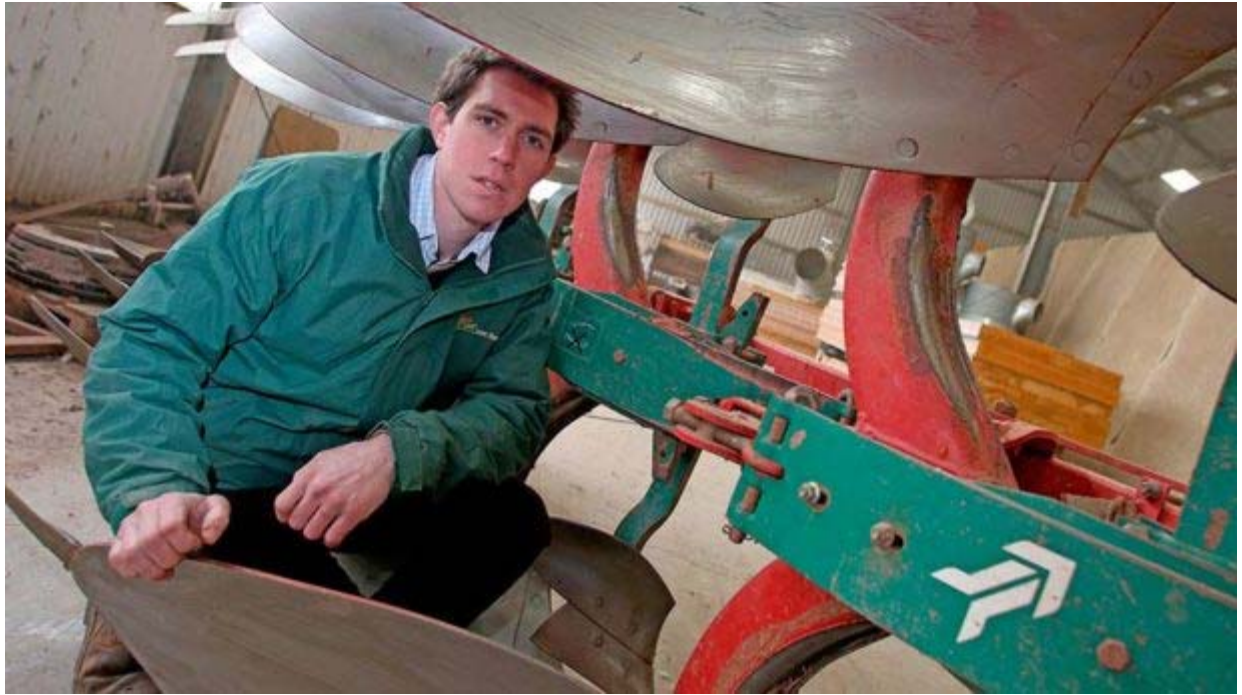
Registration is now open for the hands-on Building Healthy Soils workshops, which will focus on discovering ways of building healthy, live soils on grazing properties.

<http://www.northqueenslandregister.com.au/story/4279122/workshops-investigate-healthy-soils/?cs=5195>

Farmer Focus: Return to mixed farming for better soils

[Jack Hopkins](#)

Thursday 10 November 2016 6:00



Jack Hopkins © Richard Stanton

Harvest was finally completed on 6 October to finish what could be described as an average to good season. A period of settled weather since has allowed us to complete autumn drilling in reasonable time and even allowed us to plough and drill some permanent pasture after acquiring the necessary permission from Natural England. However, the continued settled weather has made me question whether we should have taken our time and allowed our seed-beds to dry a little more before [...]

<http://www.fwi.co.uk/arable/farmer-focus-return-to-mixed-farming-for-better-soils.htm>

Soil Museum

With the rising global threat of food security, the importance of soil in agriculture and how soil responds to changing environments is crucial, especially in marginal environments such as the United Arab Emirates (UAE). What happens underground? How this is changing? What are the impacts? These questions are worth answering and exploring.

The sandy soils that cover close to 75% of the UAE require special management practices for productive cultivation. Due to the specific desert and hot environment in which they are found, UAE soils are prone to severe land degradation reducing their productive capacity. Yet, the UAE deserts are dynamic and there is a need to have a record of them. Usually soils are preserved in natural history museums but there are very few soil museums in the world and none in the Arab region.

In response to this, the International Center for Biosaline Agriculture (ICBA) in collaboration with the Environment Agency - Abu Dhabi (EAD) and the Ministry of Climate Change and Environment, agreed on the need to establish a Soil Museum and construction was started. <http://www.biosaline.org/node/5656>

Crack discovered in Earth's magnetic shield

Date:

3 November 2016

Source:

Tata Institute of Fundamental Research

Summary:

The GRAPES-3 muon telescope recorded a burst of galactic cosmic rays of about 20 GeV, on 22 June 2015 lasting for two hours. The burst occurred when a giant cloud of plasma ejected from the solar corona, and moving with a speed of about 2.5 million kilometers per hour struck our planet, causing a severe compression of Earth's magnetosphere from 11 to 4 times the radius of Earth. It triggered a severe geomagnetic storm that generated aurora borealis, and radio signal blackouts in many high latitude countries.



The GRAPES-3 muon telescope, the largest and most sensitive cosmic ray monitor recorded a burst of galactic cosmic rays that indicated a crack in the Earth's magnetic shield.

Credit: TIFR

The GRAPES-3 muon telescope located at TIFR's Cosmic Ray Laboratory in Ooty recorded a burst of galactic cosmic rays of about 20 GeV, on 22 June 2015 lasting for two hours.

The burst occurred when a giant cloud of plasma ejected from the solar corona, and moving with a speed of about 2.5 million kilometers per hour struck our planet, causing a severe compression of Earth's magnetosphere from 11 to 4 times the radius of Earth. It triggered a severe geomagnetic storm that generated aurora borealis, and radio signal blackouts in many high latitude countries.

Earth's magnetosphere extends over a radius of a million kilometers, which acts as the first line of defence, shielding us from the continuous flow of solar and galactic cosmic rays, thus protecting life on our planet from these high intensity energetic radiations. Numerical simulations performed [...]

Journal Reference:

1. P. K. Mohanty, K. P. Arunbabu, T. Aziz, S. R. Dugad, S. K. Gupta, B. Hariharan, P. Jagadeesan, A. Jain, S. D. Morris, B. S. Rao, Y. Hayashi, S. Kawakami, A. Oshima, S. Shibata, S. Raha, P. Subramanian, H. Kojima. **Transient Weakening of Earth's Magnetic Shield Probed by a Cosmic Ray Burst.** *Physical Review Letters*, 2016; 117 (17) DOI: [10.1103/PhysRevLett.117.171101](https://doi.org/10.1103/PhysRevLett.117.171101)
<https://www.sciencedaily.com/releases/2016/11/161103125930.htm>

Soil health survey kick-starts cover crop trials

[Andrew Meredith](#)

Wednesday 23 November 2016 6:01



Cover crops and applying manures can help growers cut the damage from the intensive cultivations often necessary when establishing potatoes. Building soil resilience through the rotation is essential, as farms growing potatoes can have one-third less organic matter than those without them. Hutchinsons agronomists Ed Brown and Geoff Bastard say growers need to build up soil fertility ahead of potatoes and avoid leaving ground bare during the winter. See also: 9 top tips to ensure crops get sufficient sulphur They [...]

<http://www.fwi.co.uk/arable/soil-health-survey-kick-starts-cover-crop-trials.htm>

Writing an equation for soil success

By Kaine Korzekwa

Soil isn't one size fits all. It may look the same under your feet – but under a microscope, that's a different story. A plant's roots, tiny bugs – these things can tell one soil from another quite easily.



This large 5 liter core sample from a grassland will be used for soil structural measurements..Photo credit Ole Wendroth.

Soil scientists typically measure different aspects of soil — how much air it contains, how well it retains water, heat, and more — to determine if it is best for a specific purpose. These are called soil physical properties.

And, when it comes to building on or growing in soil, it's important to know its many physical properties. Does water flow through the soil or run right over the surface? Quickly or slowly? How much water and air can it provide? How hard is it for roots and farm equipment to get through?

Soil sustains crops, forests, animal production, urban development, and even projects like building silos, dams, and greenhouses. Robson Armindo, a professor at the Federal University of Paraná in Brazil, wanted to better understand the interactions of soil, air, and water. He worked with Ole Wendroth from the University of Kentucky.

<https://www.soils.org/discover-soils/story/writing-equation-soil-success>

There's still lots to learn about Australia's flood patterns

The journal *Climatic Change* has published a [special edition](#) of review papers discussing major natural hazards in Australia. This article is the first in a series looking at those threats in detail.

Recent floods in [New South Wales](#), [South Australia](#) and [Victoria](#) have reminded us of the power of our weather and rivers to wreak havoc on homes, business and even, tragically, lives.

As Dorothea Mackellar [poetically pointed out](#), "droughts and flooding rains" have been a feature of Australia throughout history, so maybe we shouldn't be all that surprised when they happen. <http://phys.org/news/2016-11-lots-australia-patterns.html>

Soils data refreshed, available at Web Soil Survey

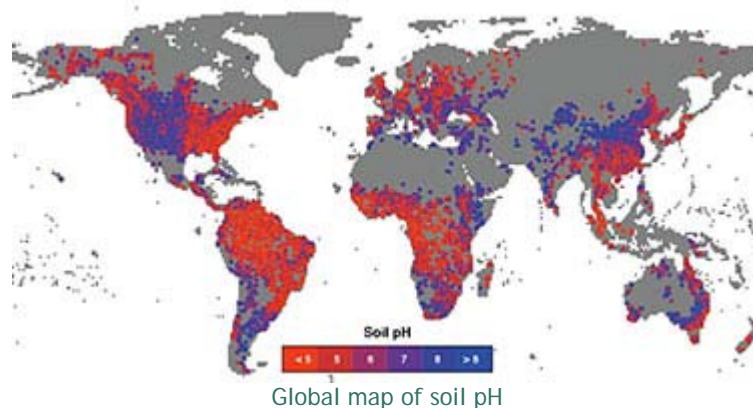
(Des Moines)--USDA's Natural Resources Conservation Service (NRCS) announced last week that soils information for Iowa landowners is updated and available for free online, via Web Soil Survey – the most widely used website for accessing soils information in the United States for making land use decisions.

Iowa NRCS State Soil Scientist Rick Bednarek says each survey now contains a full complement of soils data, giving users the ability to analyze soil-based interpretations regionally, multi-state, or across the country. http://www.kmaland.com/ag/soils-data-refreshed-available-at-web-soil-survey/article_71211712-b0ba-11e6-aeec-b768564c9f39.html

Amount of rainfall linked to soil pH worldwide

28 Nov 2016

For many years, scientists have known there's a link between the amount of rainfall in a region and soil pH. Now, for the first time, a team from the US and China has investigated [the soil pH-water-balance relationship on a global scale](#).



"Soil pH is important because it controls many aspects of soil fertility," [Eric Slessarev](#) told [environmentalresearchweb](#). "We show that soil pH tends to be controlled by two chemical reactions, and that climate tips the balance between these two reactions, driving an abrupt switch from alkaline pH in dry climates to acid pH in wet climates."

<http://environmentalresearchweb.org/cws/article/news/67143>

Middle East dust storm not caused by conflict, study finds

Climate change, not the ongoing regional conflict, was behind last year's huge dust storm in the Middle East, according to new research published in *Environmental Research Letters*. The storm in September 2015 affected Syria, Lebanon, Turkey and Cyprus, leading to scores of people being hospitalised, ports being closed, flights being cancelled, and large portions of

the affected countries and the eastern Mediterranean Sea being covered in an unprecedented haze.

At the time, several media reports blamed land cover change attributed to conflict, including agricultural land desertion, reduced irrigation, and increased military vehicle traffic over unpaved surfaces for the unusually severe storm. <http://phys.org/news/2016-11-middle-east-storm-conflict.html>

Vital soil fungi damaged by GMO Bt cotton

Dr Eva Sirinathsinghji

24th November 2016

A study of GMO cotton varieties shows they disrupt an important beneficial soil fungus, writes Eva Sirinathsinghji, apparently due to the Bt insecticide they are engineered to express. Disruption caused by the transgenic cotton to mycorrhizal fungi, and the wider soil ecosystem, may underlie the low yields and poor pest resistance now endemic among Bt GM crops.

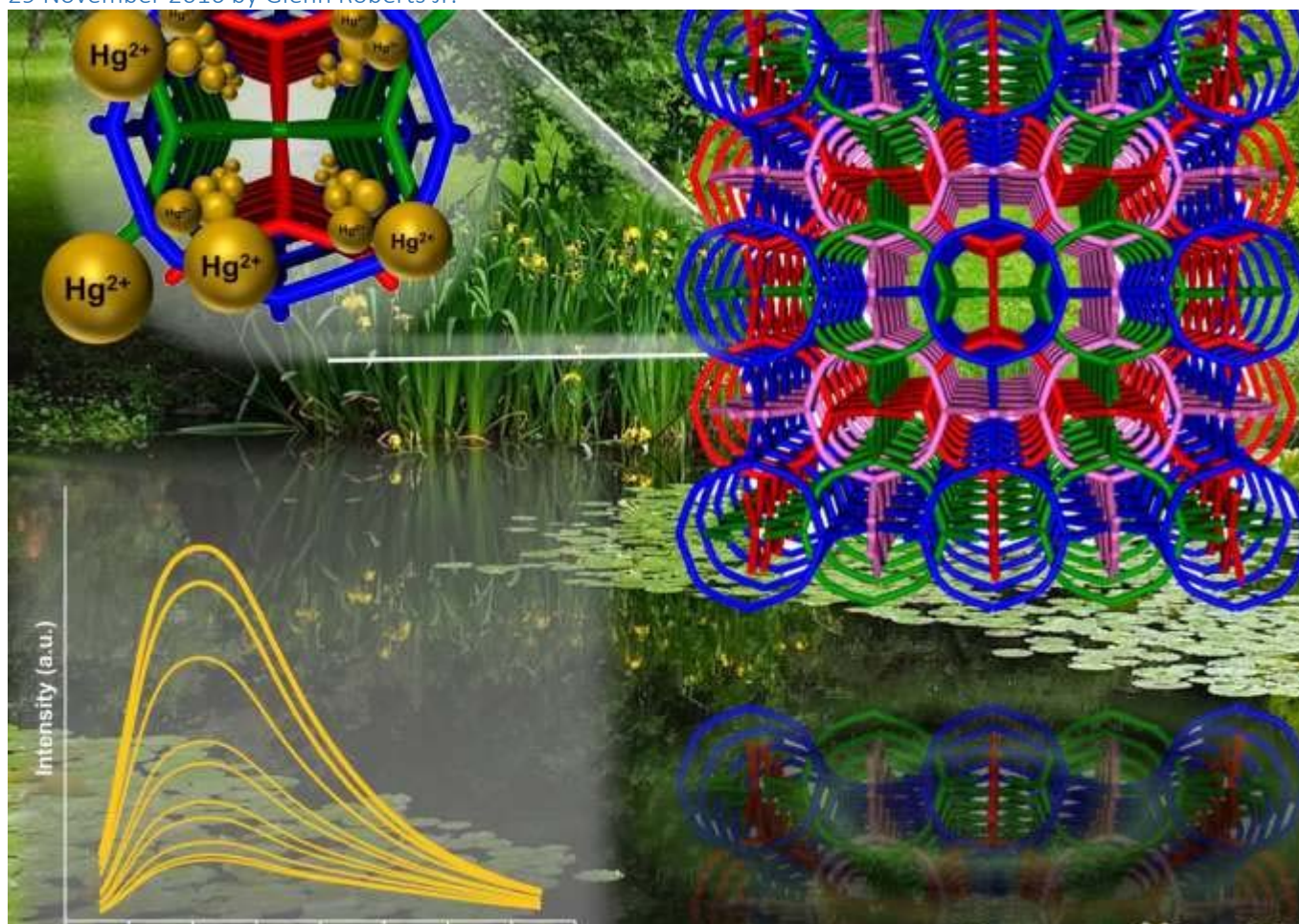


Bt GMO crops are designed to combat pests like the *Helicoverpa armigera* moth, which causes A\$25 million of damage a year in Australia alone to crops such as cotton, legumes and vegetables. But there is a cost: damage to beneficial soil fungi. Photo: CSIRO via Wikimedia Commons (CC BY).

http://www.theecologist.org/News/news_analysis/2988361/vital_soil_fungi_damaged_by_gmo_bt_cotton.html

Glowing crystals can detect, cleanse contaminated drinking water

29 November 2016 by Glenn Roberts Jr.



Researchers have developed a specialized type of glowing metal-organic framework, or LMOF (molecular structure at center), that is designed to detect and remove heavy-metal toxins from water. At upper left, mercury (Hg^{2+}) is taken in by the ...[more](#)

Tiny, glowing crystals designed to detect and capture heavy-metal toxins such as lead and mercury could prove to be a powerful new tool in locating and cleaning up contaminated water sources.

Read more at: <http://phys.org/news/2016-11-crystals-cleanse-contaminated.html#iCp>

Soil health partnership targets economics, environment

Ray Mueller, Correspondent 10:08 a.m. CDT 12 September 2016



Flowering crimson clover, which is popular in Europe and also known as Italian clover, stands out in a cover crop test plot at Roehrborn Farms in Sheboygan County. (Photo: Ray Mueller)

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JOHNSONVILLE

A multi-state partnership launched three years ago by the National Corn Growers Association is striving to have 100 farmer members who would commit to five years of on-farm projects designed to compare how differing management practices affect soil health.

Titled Soil Health Partnership, the network has enrolled 65 members – the great majority of them in Iowa, Illinois, and Indiana. At the moment, there are three in Wisconsin. <http://www.wisfarmer.com/story/news/2016/09/12/soil-health-partnership-targets-economics-environment/90257626/>

Survey of New York City soil uncovers medicine-making microbes

28 November 2016



Researchers in the Brady lab, postdoc Zachary Charlop-Powers, above, examine DNA from soil samples that might encode microbial molecules with interesting properties. Credit: Zach Veilleux/The Rockefeller University
Microbes have long been an invaluable source of new drugs. And to find more, we may have to look no further than the ground beneath our feet. <http://phys.org/news/2016-11-survey-york-city-soil-uncovers.html>

Farmer Focus: No-till wheat looks better than conventional

[Matt Redman](#)

Saturday 19 November 2016 6:00



© Tim Scrivener

In some ways it has been an easy autumn here. Very low rainfall has meant field work could be undertaken almost every day, helping with planning and allowing machines to comfortably carry out the required workload. It has been a fantastic autumn for no-till drilling, the dry conditions at harvest minimised soil damage from harvest traffic, and the continued dry conditions meant that autumn drilling was also fairly easy. Wheat that has been established using no-till has so far emerged [...]
<http://www.fwi.co.uk/arable/farmer-focus-no-till-wheat-looks-better-conventional.htm>

Scientist promotes idea of soil amendment

Jan Shepel



Noel Anderson, a licensed soil scientist and geologist, believes that small bits of charcoal, like those he's holding here – called biochar -- can have a big impact on improving Wisconsin soils. He speaks to grower's groups whenever he can to promote the idea of carbon balancing.(Photo: Jan Shepel)

For licensed soil scientist and geologist Noel Anderson, the process of using biochar to amend soils is a way to “rebalance the checkbook on carbon and water” – it’s an account that humans have “overdrawn” for generations. Biochar - charcoal produced

from plant materials – can be used to amend the soil and also to remove carbon from the atmosphere.

Calling it the “inverse of a coal mine” he explains that biochar is the process that Nature has been using for thousands of years to improve and amend prairie soils. In Iowa and central Illinois, where the soils are reputed to be some of the best in the world, the process went on for centuries.

<http://www.wisfarmer.com/story/news/2016/10/12/biochar-can-rebalance-soil-checkbook/91937956/>

"The multiple roles of soils often go unnoticed. Soils don't have a voice, and few people speak out for them."

José Graziano da Silva, FAO Director-General