



NEWS BULLETIN

Plants and Pollution

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Vol. 11, November 2019

Plant Tackle Air Pollution Better than Tech

CSIR-NATIONAL BOTANICAL RESEARCH INSTITUTE, LUCKNOW

Guest post: Will plants help make the planet wetter or drier in a changing climate?

Carbon Brief, 05 November 2019

NowThe way that plants and trees respond to a warming climate and increasing levels of atmospheric CO₂ has a significant impact on how they use water.

But will this leave more or less freshwater available for societies to use? That millions of people suffer from life-threatening water stresses in the current climate tells us that the answer to this question really matters.

Our new study, published in Nature Geoscience, attempts to shed light on this complicated picture.

We find that in mid-latitude regions, such as North America, Europe and Central Asia, plants will consume more water in future, resulting in less water in soils and rivers – even where climate models say rainfall will also increase.

The two images below show the state of the second largest reservoir, Lake Oroville, in the world's eighth largest economy, California, a mere three years apart. (Use the slider to switch between 2011 and 2014.) The cause of the drastic reservoir depletion on the right was a devastating drought from 2011-15, which cost farmers \$2.7bn in 2015 alone.

Droughts such as these punctuate California's history, but they are becoming more severe as the human impact on climate intensifies. Will such trends continue or are there other factors that may counteract the increasing drying of essential agricultural and economic areas?

The challenge in answering this question is that the models we use to.....

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How Plants Can Help You Tackle Air Pollution, Probably Better Than Tech

Swirlster, 10 November 2019

With air pollution being one of the top health concerns today, it's time to take effective measures to fight the harmful effects of it. While air purifiers and pollution masks are an absolute must-have, getting your hands on a range of air purifying plants can also make a huge difference. Yes, you heard us. Air purifying plants like areca, spider, peace lily, sansevieria green, money plant and others work effectively in reducing harmful pollutants and toxins from the air to make it better for you to breathe. According to a study conducted by Ohio State University, plants and trees may be better and cheaper options than technology to mitigate air pollution.

The study, published in the journal Environmental Science & Technology, found that adding plants and trees to the landscapes near factories and other pollution sources could reduce air pollution by an average of 27 per cent. Researchers found that in 75 per cent of the countries analysed, it was cheaper to use plants to mitigate air pollution than it was to add technological interventions - things like smokestack scrubbers - to the sources of pollution. "The fact is that traditionally, especially as engineers, we don't think about nature; we just focus on putting technology into everything," said Indian-origin researcher and study lead author Bhavik Bakshi from.....

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Climate Change and Rice

CSIR-NATIONAL BOTANICAL RESEARCH INSTITUTE, LUCKNOW

Climate Change Could Double Toxic Arsenic in Rice

Futurity, 01 November 2019

Elitzur New experiments exploring rice production in future climate conditions show rice yields could drop about 40% by 2100—with potentially devastating consequences in parts of the world that rely on the crop as a basic food source.

What's more, changes to soil processes due to increased temperatures will cause rice to contain twice as much toxic arsenic than the rice consumed today, according to the study, published in Nature Communications.

“By the time we get to 2100, we're estimated to have approximately 10 billion people, so that would mean we have 5 billion people dependent on rice, and 2 billion who would not have access to the calories they would normally need,” says coauthor Scott Fendorf, professor of earth system science at Stanford University's School of Earth, Energy & Environmental Sciences. “We have to be aware of these challenges that are coming so we can be ready to adapt.”

Researchers specifically looked at rice because it grows in flooded paddies that help loosen the arsenic from the soil and make it especially sensitive to arsenic uptake. While many food crops today contain small amounts of arsenic, some growing regions are more susceptible than others.

Future changes in soil due to higher temperatures combined with flooded conditions cause rice plants to take up arsenic at higher levels—and using irrigation water with naturally occurring high arsenic exacerbates the,..... [Read More...](#)

Climate Change Effects May Soon Expose Billions Of People To Toxic Rice

Medical Daily, 04 November 2019

The Many parts of the world have been experiencing the growing impact of climate change. The rising temperatures are expected to affect the sea levels and global food supply in the future.

A new study, published in the journal Nature Communications, found that the world may soon see a dramatic drop in rice production. Climate change has been causing changes to soil processes, which increase levels of toxic arsenic in rice.

“I just didn't expect the magnitude of impact on rice yield we observed,” Scott Fendorf, study co-author and a professor of earth system science at Stanford University, said. “What I missed was how much the soil biogeochemistry would respond to increased temperature, how that would amplify plant-available arsenic, and then—coupled with the temperature stress—how that would really impact the plant.”

Researchers said the increasing temperatures combined with flooding could significantly increase arsenic from the soil and being absorbed by rice plants. Arsenic is a naturally occurring, semi-metallic chemical linked to cancer, lung disease, skin lesions and even death, Futurity reported.

“By the time we get to 2100, we're estimated to have approximately 10 billion people, so that would mean [Read More...](#)



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Forest and Pollution

CSIR-NATIONAL BOTANICAL RESEARCH INSTITUTE, LUCKNOW

Forests face climate change tug of war

Science Daily, 26 November 2019

In a world of rising levels of atmospheric carbon dioxide, plants should be happy, right? Experiments have shown that, yes, increased carbon dioxide does allow plants to photosynthesize more and use less water.

But the other side of the coin is that warmer temperatures drive plants to use more water and photosynthesize less. So, which force, CO₂ fertilization or heat stress, wins this climate tug of war?

The answer, University of Utah researchers write in a new study in Proceedings of the National Academy of Sciences, is that it depends on whether forests and trees are able to adapt to their new environment. The study, they say, incorporates aspects of a tree's physiology to explore how trees and forests respond to a changing climate.

"It's taking the physiology of individual cells and scaling it up in a computer to make projections of a continent's worth of forests," says study co-author William Anderegg.

To set the stage for this tug of war, it's important to understand how trees and plants use water.

In a tree, water is pulled up from the roots through the xylem, the tree's vascular system. The water moves to the leaves, where photosynthesis happens. On the underside of leaves, small pores called stomata open to admit CO₂ for photosynthesis. Water vapor can escape through the stomata, though, so closing stomata is required to guard against

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Chennai Adapts Japanese Botanist Miyawaki's Method of Afforestation to Fight Pollution

The Weather Channel, 28 November 2019

Just a fortnight ago, many parts of Chennai suffered 'very poor' air quality with Air Quality Index (AQI) of over 301. While rains have eased the pollution woes in the coastal city at present, deteriorating air quality air, year on year, have concerned authorities and public alike. Now, in a bid to improve air quality, the Tamil Nadu government is growing urban forests in Chennai using the a method developed by Japanese botanist Akira Miyawaki.

The Miyawaki forest system helps build dense forests with native plant species and is gaining currency across India. S.P. Velumani, Minister for Municipal Administration, Rural Development and Implementation of Special Programme confirmed with a tweet on Wednesday that Miyawaki forests will be grown in Chennai.

"Miyawaki, a Japanese-densely-foliated green landscape, is being employed to reduce environmental pollution and improve air pollution in Chennai. For the first time, trees were planted in the land situated in Kotturpuram, Chennai". Said the minister in a tweet in Tamil. The Miyawaki method involves plantation of native tree species at proximity to each other, reducing the space between any two trees. As the trees grow into tall canopy trees, they block the sunlight almost entirely, preventing weeds and shorter plants from growing. The resulting densely wooded.....

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Plantation to Combat Climate Change

CSIR-NATIONAL BOTANICAL RESEARCH INSTITUTE, LUCKNOW

YouTubers are teaming up to plant 20 million trees

[The European Sting, 05 November 2019](#)

It's a simple idea that demonstrates how social media's power can be harnessed for good – and they're already more than halfway there. More than 600 YouTubers are rallying their followers to raise \$20 million for the Arbor Day Foundation, a US charity that plants trees and teaches conservation.

For every dollar donated, Arbor Day will fund the planting of a tree, many of them in state and national forests managed by government agencies. The goal is to plant a variety of species on every continent except Antarctica.

The #TeamTrees fundraiser started when Jimmy Donaldson, who posts on YouTube under the name MrBeast, was challenged to commemorate hitting 20 million subscribers. He called on other influencers to make the idea a reality, claiming a new fundraising record for the site.

Creative tactics have encouraged donations. Jacksepticeye hosted an eight-hour livestream of him planting trees in video game Minecraft. One online gamer donated \$10 for each kill in a Fortnite tournament, and domino artist #Hevesh5 created a giant tree out of dominoes. Tesla CEO Elon Musk donated a million trees, changing his Twitter name to Treelon.

By flooding YouTube with fundraising clips, the aim is to push videos about climate change and the environment higher up the platform's recommended lists, and ultimately to a broader audience. Engaging people in conservation is important, since the WWF estimates we're losing the equivalent of 27 soccer fields of trees

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Young Farmers to plant 9,000 trees to combat climate change

[Farmers Weekly, 26 November 2019](#)

Young Farmers from across England and Wales have begun planting more than 9,000 trees in a bid to combat climate change.

In total 60 Young Farmers' Clubs are playing their part in this green project by planting sapling trees supplied by The Woodland Trust, with many YFCs aiming to plant one tree for each of its members.

The drive is part of the national YFC "Protect Your Future" initiative, launched by members earlier in the year.

Young Farmers chose to plant as many trees as possible as their contribution to making a positive impact on the environment for the next generation.

NFYFC's chairman Katie Hall planted 735 sapling trees in Gloucestershire on 16 November, with support from club members, Gloucestershire NFU and the local council.

"This year YFCs have been focusing on ways to improve the environment through our campaign and it's great to see so many of our members making a positive impact on their local environment. The trees are a real symbol of hope for the next generation." John Tucker, director of woodland outreach at The Woodland Trust, said: "Trees play a vital role in our lives. They provide shelter and shade, protect our soils, filtrate our water, provide a home for wildlife, add value to our streets and give us a place to relax and unwind. "They play a pivotal role in the fight against ,

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