



## News

**Struggling for breath: Getting carbon dioxide into cells for photosynthesis**

During photosynthesis, leaves capture carbon dioxide (CO<sub>2</sub>) from the atmosphere and transform it into organic compounds. However, getting from the leaf surface to the enzymes where carbon is fixed inside leaves is full of challenges. Understanding how each of the many obstacles CO<sub>2</sub> molecules encounter in their frantic adventure to fixation is essential, if we want to manipulate them and improve crop production. In a Tansley review published this week in the journal *New Phytologist*, Professor John Evans from the ARC Center of Excellence for Translational Photosynthesis, reviewed the literature published on leaf mesophyll conductance and created a "leaf profile" of the different components that are involved in the CO<sub>2</sub> journey inside the leaf and their relative importance. [.....Read more...](#)

Date: November 02, 2020

Source: phys.org

**To predict how crops cope with changing climate, 30 years of experiments simulate future**

Over the past 30 years, a network of 14 long-term research facilities spanning five continents has simulated future levels of carbon dioxide (CO<sub>2</sub>) to forecast the impact on crops. Importantly, these 'Free-Air Concentration Enrichment' (FACE) experiments are conducted outside in real-world field conditions to capture the complex environmental factors that impact crop growth and yield. Today, a review published in *Global Change Biology* synthesizes 30 years of FACE data to grasp how global crop production may be impacted by rising CO<sub>2</sub> levels and other factors. The study portends a less optimistic future than the authors' previous review published 15 years ago in *New Phytologist*. "There are likely genetic solutions, should society decide to act on these -- however, time is short," said co-author Stephen Long, Ikenberry Endowed University Chair of Crop Sciences and Plant Biology at the University of Illinois. "It's quite shocking to go back and look at just how much CO<sub>2</sub> concentrations have increased over the lifetime of these experiments," said co-author Lisa Ainsworth, a research plant physiologist with the U.S. Department of Agriculture, Agricultural Research Service (USDA-ARS). [.....Read more...](#)

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Source: Science Daily

**From nitrate crisis to phosphate crisis?**

The aim of the EU Nitrates Directive is to reduce nitrates leaking into the environment in order to prevent pollution of water supplies. The widely accepted view is that this will also help protect threatened plant species which can be damaged by high levels of nutrients like nitrates in the soil and water. However, an international team of researchers including the Universities of Göttingen, Utrecht and Zurich, has discovered that many threatened plant species will actually suffer because of this policy. The results were published in *Nature Ecology and Evolution*. Nitrogen, in the form of nitrates, is an important nutrient for plant species. However, an overabundance can harm plant biodiversity: plant species that thrive on high levels of nitrates can displace other species adapted to low levels. "Despite this, it is not enough simply to reduce the level of nitrates," says co-author Julian Schrader, researcher in the Biodiversity, Macroecology and Biogeography Group at the University of Göttingen. "Such a policy can even backfire and work against the protection of threatened plant species if other nutrients are not taken into [.....Read more...](#)

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Source: phys.org

**The root of microplastics in plants**

Over the last decade, scientists have been scrambling to understand the impacts of microplastics. With the breakdown of plastic bottles, washing the world's seven billion fleece jackets, or the microbeads in face cleansers, microplastics are piling up. How they affect living things like plants is still unclear. In soil, plastics have the potential to cause problems at the chemical level. Like a magnetic attraction, contaminants can bind to plastics, resulting in toxic accumulation. Contaminants can also hitch a free ride on plastics and potentially make their way into plants. But first, researchers need to know if microplastics—or their even smaller offspring called nanoplastics—can get into plant cells in the first [.....Read more...](#)

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Source: phys.org

**Climate-adapted plant breeding**

The famous seed vault in Spitsbergen and national gene banks retain hundreds of thousands of seed samples to preserve old varieties of crop plants and the genetic diversity associated with them. Are these seed banks gold mines or seed cemeteries? Researchers around the globe are investigating whether retained samples contain genes that have been lost through breeding which could be beneficial in counteracting climate change. A research team led by Chris-Carolin Schön, Professor of Plant Breeding at the TUM, is now presenting a solution to harness the genetic potential of old varieties, so-called [.....Read more...](#)

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