

# Plant biology advances rapidly to help feed the world

May 7 2013

---



(Phys.org) —A series of new discoveries in plant cell biology will help to increase the supply of food and energy for our rapidly growing global population, according to 12 of the world's leading plant biologists.

The experts, including Winthrop Professor Rana Munns from The University of Western Australia's School of Plant Biology and Institute of Agriculture, review and report on recent rapid advances in plant biology research in the latest issue of the journal *Nature*.

The experts write in their paper that with [global population](#) predicted to grow by at least 25 per cent by 2050, the need for sustainable production of nutritious foods is critical for human and environmental health. With

the sustainable limit of 15 per cent of the Earth's surface able to be exploited for crop production having almost been reached, innovative solutions are needed to produce more food on arable land.

Recent advances show that specialised plant membrane transporters can be used to enhance yields of [staple crops](#), increase nutrient content and increase resistance to key stresses, including salinity, pathogens and toxicity from [heavy metals](#). This in turn could expand available arable land.

Membrane transporters are a class of specialised proteins that plants use to take up nutrients from the soil, transport sugar and resist toxic substances such as salt and aluminium.

In the paper, Professor Munns describes research on sodium transporter genes from plants and their application in breeding salt-tolerant [wheat varieties](#). Her work is one of the few examples where fundamental research has been translated into practical applications and has resulted in enhanced yields of up to 25 per cent on salt-affected soils.

Other developments described by the authors include the role of [transport proteins](#) in moving essential micro-nutrients into grain, the potential of manipulating the uptake of major [mineral nutrients](#) such as nitrogen and phosphorus, and how sugar transporters can be manipulated to combat plant disease.

The authors say the research findings demonstrate that understanding the biology of plant membrane transporters can be a key contributor to the goal of global food security, leading to non-genetically modified yet novel science-based rapid solutions to crop improvement programs.

"Our knowledge of the molecular nature and regulation of transporters has expanded vastly over the past twenty years," they write. "As shown

in the examples here, fundamental research into transport mechanisms in plants is leading to rapid innovations for improving yields, extending the range of arable land that can be used for crops and improving the performance of plants under stress.

"This research also points to new solutions for more sustainable use of limited soil nutrients and for enhanced human nutrition through biofortification."

The paper "Using membrane transporters to improve crops for sustainable food production" was published in *Nature* on May 1. Its authors are leading plant biologists from institutions in Australia, the United States, Mexico, Japan, Taiwan and the United Kingdom.

Provided by University of Western Australia

Citation: Plant biology advances rapidly to help feed the world (2013, May 7) retrieved 27 April 2024 from <https://phys.org/news/2013-05-biology-advances-rapidly-world.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.