

Scientists forecast crops that adapt to changing weather

December 13 2011

Crops that can cope with sudden fluctuations in the weather could be developed, thanks to fresh discoveries about the survival mechanisms of plants.

Scientists studying how tiny algae renew old or damaged cell proteins say their findings could be useful in developing crops suited to climates in which weather changes quickly.

Researchers found that the speed at which protein renewal takes place dictates how quickly they can adapt to environmental changes, such as a sudden frost or [drought](#).

The team found that renewal rates vary between proteins according to their role and their location within [cells](#). Proteins that carry out [photosynthesis](#) – the process that converts sunlight into energy – renew quickly because they are at risk of light damage. Conversely, proteins that protect DNA in plant cells are at little risk of damage, and renew slowly.

The findings, by researchers at the University of Edinburgh, could help breed crops incorporating proteins that respond quickly to changing conditions. Conversely, it could also assist development of high-yield [crops](#) in stable environments, where little adaptation to conditions is required.

Scientists made their discovery by developing a method to detect how

quickly algae take up nitrogen – which is used to produce proteins – from their food. The study was funded by the Biotechnology and Biological Sciences Research Council and the Engineering and Physical Sciences Research Council, and published in the *Journal of Proteome Research*.

Dr Sarah Martin of the University of Edinburgh's Centre for Systems Biology, who led the study, said: "Until now, we knew that plants replaced their old and damaged proteins, but we had no idea how long this process took for individual proteins, or how this varied between different parts of the plant. Our findings will be useful in understanding more about how plants are programmed for survival."

Provided by University of Edinburgh

Citation: Scientists forecast crops that adapt to changing weather (2011, December 13) retrieved 24 April 2024 from <https://phys.org/news/2011-12-scientists-crops-weather.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.