

# Ancient genes used to produce salt-tolerant wheat

February 1 2007

---

Two recently discovered genes from an ancient wheat variety have led to a major advance in breeding new salt-tolerant varieties.

In a recent set of papers published in the journal *Plant Physiology* researchers describe the two genes – known as Nax1 and Nax2. The genes work by excluding salt from different parts of the plant: one from the roots, the other from the leaves. The discovery of the two genes is the subject of international patents.

“The two genes originally came from a wheat ancestor, *Triticum monococcum*,” says research team leader, CSIRO Plant Industry’s Dr Rana Munns. “They were unwittingly crossed into a durum wheat line about 35 years ago and are normally not present in any modern wheat.”

The project began when the CSIRO team used a highly accurate selection method – based on their understanding of how plants tolerate salt – to identify wheat varieties that could cope with higher salinity. They were particularly interested in the premium-priced durum wheat, which is much more salt-sensitive than bread wheat.

“We screened a hundred durum wheats from the Australian Winter Cereals Collection at Tamworth, which contains tens of thousands of wheat types,” Dr Munns says. “Highlighting the fact that the science of plant breeding sometimes relies on an element of good fortune, we were lucky to find the durum variety with the ancient genes straight away, otherwise we might have been looking for years.”

The team used their knowledge of the two genes to construct molecular markers, which are now in use in CSIRO's wheat breeding program. A durum wheat variety as salt-tolerant as bread wheat is in advanced field trials and could be commercially available in three years. Even better durum wheats are in development and the program has been expanded to include bread wheat.

“Bread wheat is quite tolerant to salt, but we think it too can be improved. Our aim is to eventually produce wheats able, like barley, to grow in highly saline soils,” Dr Munns says.

Over six per cent of the world's arable land is affected by salinity. Salt tolerant crops can provide farmers with income for remediation, as well as helping to stabilise soil from wind and water erosion.

Source: CSIRO

Citation: Ancient genes used to produce salt-tolerant wheat (2007, February 1) retrieved 20 March 2024 from <https://phys.org/news/2007-02-ancient-genes-salt-tolerant-wheat.html>

<p>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.</p>
--