

## ACPF RESEARCHERS HAVE IDENTIFIED the gene responsible for boron tolerance.

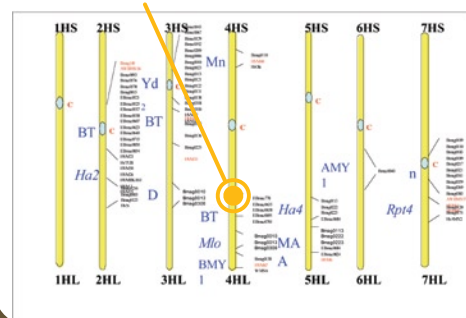
**BORON IS A SOIL MICRONUTRIENT WHICH AT HIGH LEVELS AFFECTS CROP YIELD AND QUALITY.**



The gene which helps keep boron out of the plant's cells was identified in a boron tolerant African landrace of barley (Sahara 3771).

**BY KNOWING THE** gene's exact sequence, we can now provide diagnostic molecular markers to plant breeders to select for boron tolerance with 100% accuracy.

Chromosome 4H – the gene for boron tolerance



**BORON ACCUMULATES** in the tips of older leaves first. Toxicity is evident when the leaf tip turns yellow with characteristic brown spots (chlorosis). Chlorosis extends down the leaf margin until it causes tissue and eventual plant death (necrosis).



**A PROBLEM WITH** the conventional breeding process to introduce boron tolerance from Sahara 3771 relates to the carry over of deleterious genes that are located closely (linked) to the boron tolerance gene. This phenomenon is known as linkage drag.

Using genetic engineering we are investigating the possibility of transferring this gene into agronomically important lines. This will introduce boron tolerance, whilst avoiding the linkage drag.

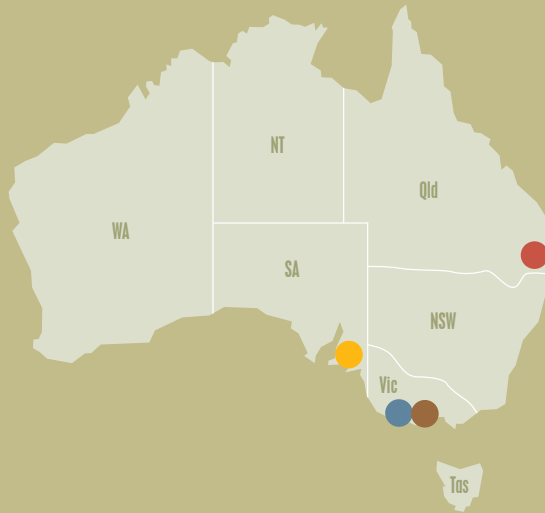
**30%** of SA's grain growing soils have levels of boron above the accepted threshold of 15mg/kg in the top 100cm of soil.

# ACPFG Research



The Australian Centre for Plant Functional Genomics (ACPFG) uses functional genomics to improve the resistance of wheat and barley to hostile environmental conditions such as drought, salinity, frost and mineral deficiencies or toxicities. These stresses, known as abiotic stresses, are a major cause of cereal crop yield and quality loss throughout the world.

To meet our mandate of delivering research outcomes nationally, ACPFG has four nodes throughout Australia. The headquarters is at the University of Adelaide's Waite Campus, with other major research nodes at the University of Melbourne, the University of Queensland and the Department of Primary Industries (DPI) at La Trobe University.



Australian Government  
Australian Research Council



**For further information or media enquiries contact:**

The Australian Centre for Plant Functional Genomics Pty Ltd, Plant Genomics Centre, Hartley Grove, Urrbrae SA 5064

Postal: PMB1, Glen Osmond SA 5064 P: +61 8 83037155 F: +61 8 8303 7102 E: [enquiries@acpfg.com.au](mailto:enquiries@acpfg.com.au) W: [www.acpfg.com.au](http://www.acpfg.com.au)