

Project No.: MPB 1/04

Project Title: Fast tracking of wheat with combined disease resistances

Project Supervisor: Dr Hugh Wallwork, Principal Research Officer, South Australian Research and Development Institute.

Contact Details: Ph: (08) 8303 9382
Fax: (08) 8303 9393
Mob:
Email: Wallwork.hugh@saugov.sa.gov.au

Executive Summary

This project and its antecedents have generated novel germplasm based on the variety Krichauff and related lines in which has been accumulated resistance to the major soil-borne and foliar diseases. Originally intended just to incorporate resistance to CCN and improve the resistance to yellow leaf spot and crown rot, the loss of resistance in Krichauff to both leaf and stripe rust required a new focus to be applied to correcting these deficiencies and incorporating a wider diversity of rust resistance into wheats for South Australia. Through association with funding from MPBCRC this SAGIT germplasm has also been used as a basis for incorporating new traits such as improved proteins, higher protein levels and salt tolerance.

A second strand of this project has been to convert the most advanced lines to white floured types to better suit some export requirements. This had proved problematic because the flour colour gene was tightly linked to a *Pratylenchus* resistance gene in Krichauff. However research in MPBCRC has shown that the same gene derived from Excalibur could be transferred without this linkage. White floured lines with the Excalibur resistance have been largely transferred into the Krichauff derived lines although these remain at an early generation stage and require further selection.

In 2006 a yield trial was sown at Kingsford that contains almost 1000 advanced lines from the SAGIT project. These will be evaluated, harvested using MPBCRC funds and selections identified for more widespread yield testing in 2007. A further 450 lines that had less seed from 2005 were sown as paired rows under irrigation at Turretfield and the best of these have been selected and will be yield tested in 2007. A very large proportion of these lines have appeared to perform well under drought at Kingsford and under rust pressure at Turretfield and we expect some very useful breeding lines to emerge from them.

One line, G52, was widely tested in interstate trials by AGT in 2005. Its average yield ranking was the same as Frame. This and the line G48 have been used extensively as new parents. Both are similar to Krichauff but have strong resistance to stripe rust and yellow leaf spot. G48 also has CCN resistance but is a little weak on leaf rust resistance. G52 has better leaf rust resistance but is missing CCN resistance.

A high yield potential, salt and drought tolerant variety from CIMMYT, Berkut, whose stress tolerance attributes are being studied in a related MPBCRC project, has been intercrossed extensively with Krichauff and G48. Promising lines from these crosses are included in the 2006 yield trials.