

Project Title: Pyramiding Sources of Drought Tolerance

AGT 0106R Final Report

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Project Supervisor: Dr S Jefferies

Contact Details: Ph: (08) 303 6862

Mob:0148 839 251

Email: stephen.jefferies@ausgraintech.com

Executive Summary

This project has contributed significantly to our understanding of the drought tolerance mechanisms underlying the elite varieties Gladius and Espada. The project has also assisted in establishing genetic resources that will be valuable for both future research and variety development in SA.

While the research is far from complete there have been some very encouraging outcomes to date. The research has identified a number of possible mechanisms that could be responsible for the elite performance of Gladius, Espada, and Axe under drought stress in SA. These results have been summarised in the following publication;

Izanloo, A. *et al* (2008). Different mechanisms of adaptation to cyclic water stress in two South Australian bread wheat cultivars. *Journal of Experimental Botany*, Vol 59, No 12, p3327-3346.

This work has assisted greatly in determining controlled environment assays for future mapping and genetic studies. QTL's identified through these assays will be compared with those for grain yield under drought stress to identify co-segregating chromosome regions which in turn will assist in identifying useful candidates for routine marker assisted selection for drought tolerance. The simple manipulation of these complex traits will significantly improve the rate of genetic gain for yield under drought stress in SA.