Project No.: S4-04

Project Title: Methods for abiotic stress selection *in vitro*

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Executive Summary

This project aimed to add additional value to the very successful isolated microspore culture (IMC) method for generating doubled haploid barley breeding lines by developing methods for selecting for abiotic stress tolerance *in vitro*. It was a high risk project but, if successful, would greatly enhance the efficiency of breeding for characteristics such as boron, salt and moisture stress tolerance and manganese efficiency.

Unfortunately, the results of this research indicated that these methods will not provide the anticipated benefits. Although *in vitro* selection did result in the selection of plants which initially appeared to be tolerant to boron stress, further analysis using pot tests and molecular markers revealed that the selected plants did not possess the expected tolerance genes.

The project did generate a great deal of interest among breeders and researchers in developing barley germplasm with abiotic stress tolerance and a proposal was developed to achieve this goal by introgressing abiotic stress tolerance genes from wild species related to barley. In the last six months of this project it was agreed by SAGIT that work should commence towards this goal and this is now being pursued through a new SAGIT project, S0107R, "Barley germplasm development using *Hordeum bulbosum*."