

The Influence of Strigolactones on Barley

Jack H. Kelly^A, Andrew J. Gilmore^A, Apriadi Situmorang^A, Matthew R. Tucker^A and Philip B. Brewer^A

^A Waite Research Institute, School of Agriculture Food & Wine, The University of Adelaide, Adelaide, SA 5064, Australia

Program theme: Metabolite and Hormone Signalling

Oral

Abstract

Strigolactones are a novel class of plant hormone that have a strong impact on a range of important traits in addition to the inhibition of tiller bud outgrowth. We have isolated a series of new barley gene edited mutants that are disrupted in the strigolactone pathway. Each type of strigolactone mutant produces distinctive effects on shoot architecture and other important crop traits, and help us understand how hormones regulate crop environmental adaption. Together with synthetic hormones and inhibitors, the mutants provide a tool kit to unravel the effect of strigolactones on various traits, including grain size, nutrient use efficiency and yield. We report on experiments that further uncover the important impact of strigolactones on crop plants and factors that affect strigolactone function. These factors include sub-optimal conditions, stressors, timing of shoot architecture decisions, the effect of tiller number on seed size, the impact of neighbour plants and the interplay with other plant hormones. We will propose a way forward for future research to find ways to utilise strigolactones for better and more consistent crop performance.