

## **The economics of tactical mechanical weed control in broadacre farming systems**

James Hagan<sup>1</sup>, Andrew Zull<sup>1</sup>, Michael Widderick<sup>2</sup> and Steven Davies<sup>3</sup>

<sup>1</sup> Queensland Department of Agriculture and Fisheries, 203 Tor St, Toowoomba, Queensland 4350, Australia

<sup>2</sup> Queensland Department of Agriculture and Fisheries, Leslie Research Centre, 13 Holberton Street, Toowoomba, Queensland 4350, Australia

<sup>3</sup> Department of Agriculture and Food Western Australia, 20 Gregory Street, Geraldton, Western Australia 6530, Australia  
(james.hagan@daf.qld.gov.au)

**Summary** With increasing pressure being placed on ever smaller available chemical modes of control, and effective chemical options significantly increasing in price as herbicide resistance removes prior control options, the difference in upfront cost of chemical and mechanical control is shrinking. For example newer formulations such as (pyrasulfotole) Velocity<sup>®</sup>, isoxaflutole (Balance<sup>®</sup>), and pyroxasolfone (Sakura<sup>®</sup>), can all cost over \$30 ha<sup>-1</sup> for a single pass at popular rates and potentially double this when taking into account the higher rates and use of double knocks to control hard to kill weeds. In addition to this upfront cost, over-reliance on a few working modes of action increases the risk of further resistance developing, thus the addition of non-chemical methods of control are a key in the war against weeds.

Farm businesses across Australia are finding that when used tactically, mechanical control of weeds is capable of increasing the profitability of their no-till farming systems, by setting up paddocks for long term control with low weed burdens, whilst not drastically compromising the benefits of their no-till operations.

Using a combination of real world examples and economic modelling, this paper will examine the economics of tactical mechanical weed control in broadacre no-till farming systems. The focus will be on the experiences of West Australian and Queensland farm businesses, specifically on dealing weed species which are currently hard to kill due to herbicide resistance or tolerance, and how they have incorporated mechanical methods of control to complement their farming systems.

**Keywords** Strategic tillage, machinery, herbicide resistance, mechanical weed control, economics.