

## Reduced tillage on the Darling Downs

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Most research conducted on Conservation Tillage in Northern Australia has concentrated on comparing aspects of zero or no-tillage and mechanical or conventional tillage practices. Little research to date has been focused on techniques involving the partial substitution of herbicides for tillage, the major problem being indecision about when and to what extent herbicides should be substituted.

### Methods

During 1983 and 1984 trials were carried out on the Darling Downs to study the effect of less extensive substitution of chemicals for tillage on the yield of wheat (four sites), barley (one site) and grain sorghum (two sites). The reduced tillage technique used for growing wheat and barley was to substitute chemicals for tillage during the months when high intensity summer storms occur (Dec.-March) to ensure maximum stubble cover minimising soil loss through erosion, and then use tillage until sowing (Apr.-June).

The reduced tillage technique used for growing sorghum was to substitute glyphosate (Roundup<sup>?</sup> herbicide) for tillage after harvest because of its effectiveness in controlling sorghum regrowth (1). Residual chemicals were then applied with the aim of controlling several germinations of weeds (March-Aug.). This was foliated by the use of tillage until sawing (Sept. - Oct.). Reduced tillage plots were sown with standard trash handling equipment.

### Results and Discussion

**Table 1. Effect of fallow tillage method on grain yield (kg ha<sup>-1</sup>) of wheat (w), barley(b), and sorghum (s).**

Rotation	Site	Zero Tillage	Reduced Tillage	Mechanical Tillage	C.V. (%)
w - b	Dalby	4788	2806	2694	4.4
w - w	Macalister	892	857	947	2.2
w - w	Tara	2898	2679	2692	7.3
w - w	Dulacca	2725	2916	2739	-
w - w	Condamine	2628	2402	2255	7.6
Mean		2399	2332	2265	
s - s	Dalby	4530	4648	4411	3.5
s - s	Jimbour	5177	5176	5176	9.5
Mean		4853	4912	4794	

The results suggest that mean winter crop yields for the three fallow tillage techniques described were similar. Ward (unpublished data) found that over a five year period winter crops grown on the Darling Downs using zero tillage yielded significantly higher than those grown using reduced tillage and that reduced tillage yields were significantly better than those achieved using mechanical tillage practices. In his trials, reduced tillage represented a single early blade treatment followed by herbicides until sowing. Rainfall during the fallow and growing period was above average for both winter and summer crops at all sites reported in this paper. More data is needed on the effect of different reduced tillage following techniques on the grain yield of summer crops. The reduced tillage technique described here has been quite widely adopted in Southern Queensland because it is simple, practical and profitable (2).

1. Monro, G.R. 1984a Proc. Seventh Aust. Weeds Conf., Perth, (in press).
2. Monro, G.R. 1984b Proc. Seventh Aust. Weeds Conf., Perth, (in press).

