

Inter row benefits across the rotation

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Three years of research on inter row sowing, in South Australia, supported by SAGIT, has identified that the system offers some clear agronomic and economic advantages. The trials were based at Kimba (Upper Eyre Peninsula), Hart (Mid North), Waikerie (Mallee) and Sandilands (central Yorke Peninsula). In 2006, a site was also located at Karkoo (Lower Eyre Peninsula).

A series of experiments was established at these sites to investigate:

- Canola plant establishment and growth in heavy cereal stubble
- Efficacy of soil applied herbicides
- Lentil harvestability
- Wheat on wheat yield performance

Crops were compared inter row to in row with standing stubble, and at Sandilands three stubble

treatments were used – standing, burnt and slashed.

The economic benefit for significantly different treatments were calculated based on \$220/t for wheat and \$500/t for canola.

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Canola plant establishment

At Sandilands canola was sown at 4kg/ha into 3t/ha of cereal stubble. At this site no significant difference in establishment was recorded between the three stubble treatments although in the slashed treatments establishment

was visually more patchy. Canola from the standing stubble yielded significantly better than that from the slashed treatment (0.59t/ha compared to 0.32t/ha). This is likely to be due to improved seed placement. The result was an increased in returns of \$63/ha.

At Karkoo inter row canola had both higher establishment and yield, and improved income by \$36/ha.

Herbicide efficacy

In 2006, we established this trial with wheat stubble loads of 6t/ha (Slashed – 6t/ha lying on the ground and Standing – 3t/ha standing, 3t/ha lying down). No crops were sown, as this was just a ryegrass control assessment trial but a trial seeder was run across the plots to simulate a sowing operation. In terms of ryegrass control with soil applied herbicides (Treflan®, Dual® and Avadex®), leaving the stubble

Table 1. Herbicide efficacy - Sandilands

Stubble treatment	% ryegrass control		
	Treflan®	Dual®	Avadex®
Burnt	89.3	66.7	38.3
Slashed	29.3	37.3	16.3
Standing	84.3	78.3	51.7
l.s.d	17.3	35.3	20.2

Table 2. Lentils at Sandilands 2006

Stubble treatment	Plant height cm	Height to 1st pod cm	Yield t/ha
Burnt	89.3	66.7	38.3
Slashed	29.3	37.3	16.3
Standing	84.3	78.3	51.7
l.s.d	17.3	35.3	20.2

standing resulted in far better weed control than in slashed stubble (Table 1).

In 2005 the same trial was established on a site with only 2t/ha of stubble and no difference between herbicide products was observed. Therefore, with stubble loads above 2 to 3t/ha we expected better herbicide efficacy when stubble is left standing. This backs up previous work with stubble loads and products such as Treflan®.

Lentils

Lentils sown into standing stubble (15cm high) were taller by 6-8 cm and the height of the first pods was also greater by 4-5cm compared to burnt stubble and stubble slashed to 4cm.

As in 2005, there was no yield advantage in sowing lentils inter row, however there was a significant advantage in the harvestability as the height to first pod increased for the inter row lentils at Sandilands (Table 2). In a farmer trial in 2005 this resulted in harvest speeds increasing in the inter row standing stubble to an average of 6 to 7km/hr compared to 3-4km/hr for in row lentils. Driver fatigue was also reduced.

Wheat on wheat

Experiments at sites in SA and NSW in 2004 and 2005 demonstrated an average yield increase of 6% (range 0 to 9%) could be achieved by sowing consecutive wheat crops inter row. In 2006, even under very low yielding conditions, there was significant yield advantages for inter

row wheat on wheat in the Mallee and Upper Eyre Peninsula.

At the Upper Eyre Peninsula site inter row wheat had increased plant establishment and higher yields than on row wheat (Table 3). This resulted in an \$18/ha improvement in income. In the Mallee, the highest yielding treatment was inter row wheat with high nutrition (Table 4). However, this resulted in only a small economic benefit due to the increased cost of additional nutrition.

Disease data has yet to be analysed for the 2006 trails but reduced root disease on the inter row could be one reason for the yield improvement.

For more information
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Table 3. Wheat at Upper Eyre Peninsula 2006

Stubble treatment	Plant # per m ²	Yeild t/ha	\$ benefit above control
On row (control)	130	0.17	-
Inter row	141	0.25	+ \$18/ha
l.s.d	10	0.06	

Table 4. Wheat at Mallee 2006

Stubble treatment	Input level*	Yeild t/ha	\$ benefit above control
On row	High	0.70	-
Inter row	High	0.83	+ \$7/ha
On row (control)	Low	0.66	-
Inter row	Low	0.70	-
l.s.d		0.15	

* high = 80kg DAPZn + 20kg urea

* low = 40kg DAPZn