

Trial 29

Press Wheels and Harrows Comparison Trial

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Kondinin Group trials in three states have shown the importance of using either harrows or press wheels in the establishment of cereal and pulse crops.

In all trial sites, harrows and press wheels help to increase crop emergence.

Rotary harrows were the most consistent performing treatment over all the trials and the different soil types although soil type did not have as much effect on the trials as expected.

These trials were conducted to demonstrate to grain producers how different post seeding soil levelling treatments and tillage implement design/specifications effect seed placement at sowing time. The trials over a range of soil types, aimed to show the effects of harrows or press wheels in seed establishment.

At each trial site one tillage implement, a combine and a range of harrows and press wheels were used to sow crops into random replicated plots under controlled conditions.

All plots were sown on the same day with identical fertiliser, seed, soil type, soil moisture status and seeding depth was aimed at 50mm.

In each trial the post seeding implements assessed included a rotary prickle chain(s), three row finger harrow, leaf harrow, a press wheel(s) and a control treatment with out any harrows or press wheels.

The Birchip trials were conducted at a set speed of 10km/hr and point change between Primary Sales Superseeders and 175mm wide sweeps.

Each treatment was randomly replicated three times to increase the accuracy of measurements and reduce errors.

The same middle eight rows of each combine plot were selected for sampling of plants in each trial. 10 plants were randomly selected from each of the eight rows and measured for depth of placement. Additional measurements taken included plant density counts, yields and seed germination tests.

Birchip trial results

Table One: Summary of trial results comparing seed placement and emergence using harrows and press wheels

Treatment	Birchip narrow point		Birchip wide point	
	Avg.dept h (cm)	density p/m2	Avg.depth (cm)	density p/m2
no harrows	6.9	50	7.0	72
leaf harrows	6.3	90	7.7	88
heavy leaf harrow	5.8	90	8.3	103
finger harrows	6.7	105	8.3	98
prickle chain Smale	6.2	102	8.3	110
prickle chain Phoenix	6.9	98	7.0	120
press wheel wide	4.9	75	7.7	82
press wheel narrow	6.8	98	7.8	88
press wheel soft	6.3	103	6.3	92
press wheel closing	5.6	98	5.6	90

In all treatments the wheat densities were higher when some form of soil levelling device was used. The two rotary prickle chains produced the best results and the narrow Super seeder point showing a similar less variable depth across all treatments. (see table one)

The narrow Superseeder point result in a shallower seed placement with the wide points producing larger ridges. Phoenix harrows were the most effective at levelling the soil ridges and the closing and soft press wheels left a more uniform average seed depth between the two point types.

Table Two: Yield results summary of trial results comparing harrows and press wheels by point type

Treatment name	Rep1 t/ha	Rep2 t/ha	Rep3 t/ha	Average
Control (no harrows) 10km/hr T boot	3.33	0.00	3.33	3.33
Light Leaf harrows 10km/hr T boot	3.89	4.17	5.28	4.44
Heavy Leaf harrows 10km/hr T boot	4.17	4.72	4.17	4.35
Finger harrows 10km/hr T boot	3.61	2.22	5.28	3.70
Smale Rotary harrow 10km/hr T boot	3.33	4.17	3.61	3.70
Phoenix Rotary harrow 10km/hr T boot	3.89	4.17	5.56	4.54
Press Wheels 35mm 10km/hr T boot	3.33	4.44	5.56	4.44
Press Wheels 50mm 10km/hr T boot	3.89	4.72	6.11	4.91
Press Wheels soft 10km/hr T boot	3.61	4.17	5.83	4.54
Press Wheels closing 10km/hr T boot	3.89	4.17	4.72	4.26
Control (no harrows) 10km/hr 7" sweep	3.33	4.44	4.44	4.07
Light Leaf harrows 10km/hr 7" sweep	3.33	4.44	5.56	4.44
Heavy Leaf harrows 10km/hr 7" sweep	3.61	3.33	3.33	3.43
Finger harrows 10km/hr 7" sweep	3.33	4.17	5.56	4.35
Smale Rotary harrow 10km/hr 7" sweep	3.61	4.17	5.56	4.44
Phoenix Rotary harrow 10km/hr 7" sweep	5.56	4.44	5.56	5.19
Press Wheel 35mm 10km/hr 7" sweep	3.61	4.72	5.56	4.63
Press Wheels 50mm 10km/hr 7" sweep	4.17	4.44	3.33	3.98
Press Wheels soft 10km/hr 7" sweep	3.61	3.89	5.83	4.44
Press Wheels closing 10km/hr 7" sweep	3.06	3.61	4.44	3.70

The range of yields between the trials varied between 2.22 and 6.11t/ha. The second replication had the lowest and most variable yield results. Overgrowth of medic weeds greatly affected three of the plots.

There was little yield difference between the two point types but the two prickle chains had a slightly higher yield advantage. Again all treatments with some form of soil levelling yielding higher than the control plots with no harrows at all. This shows that improved germination during crop establishment leads to improved yields.

Summary

The important message from these trials is that any post seeding treatment is better than none at all. Finger and leaf harrows performed similarly but still lacked the ability to take more of the ridges and fill the furrow left by the rear tines.

Rotary harrows clearly demonstrated the ability to level ridges in all four trials over the range of soil types.

Press wheels produced less variable spread of seed placement and generally improved establishment. Accuracy of seed placement for press wheels is dependent on the level of soil disturbance and how effective levelling of ridges achieves an even soil depth over seed rows.

Point size influence varied between trials for deeper or shallow seed placement due to soil types, type of narrow point and row spacing of machines.

The influence of speed was not as large as expected in these trials, but there was a tendency for increased speed to affect the uniformity of seed depth detrimentally.

Influence of tine patterns on seed placement was greater than expected with continuing effects of the shallower sowing of the rear row of tines all treatments.

Press wheels performed similar to the other harrows under the trial conditions, but more research over several seasons and local soil types are required before specific recommendations can be made.

Graph One: Summary of Birchip crop establishment trials of harrows and press wheels.

