

Stubble direction – does it matter?

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Key findings

- Stubble direction and height (plus or minus stubble) had no effect on crop establishment or grain yield for Blitz and Ace lentils.
- Similarly stubble direction had no effect on grain yield or quality for Mace wheat or Commander barley.
- Annual ryegrass counts were the same in rows sown North-South and East-West.

Why do the trial?

There is evidence to suggest that the direction in which crops are sown and harvested can affect the shading of crops and weeds and potentially grain yield. In theory, stubble orientated east-west will encounter a higher number of hours in the day when the inter-row portion of soil is shaded. This may impact crop growth compared to stubble orientated North-South. This aim of the trials below was to:

1. Investigate if stubble/seeding direction and management (plus or minus stubble) effects lentil growth and yield (**lentil trial**).
2. Investigate if stubble/seeding direction effects crop competition and cereal grain yield (**cereal trial**).

How was it done?

Plot size	1.75 m x 10.0 m	Fertiliser	DAP (18:20) + 2% Zn @ 80 kg/ha
Seeding date	15 th May (lentil trial) 28 th May (cereal trial)		

Lentil stubble direction trial

In 2013 Wallup wheat (100 kg/ha) was sown in two directions, north-south and east-west. These plots were harvested and become the stubble/seeding direction treatments. In 2014 the trial consisted of two sowing directions (north-south, east-west), two lentil varieties (Ace and Blitz) and two stubble treatments (plus or minus stubble). Prior to seeding half the stubble plots were cut and straw removed (minus stubble, 15-20 cm) while the remaining plots were left standing (plus stubble, 40 cm).

All plots were assessed for plant establishment and grain yield.

Cereal stubble direction trial

In 2013 Wallup wheat (100 kg/ha) was sown in two directions, north-south and east-west. The trial area has an inherently high annual ryegrass seed bank. However, in 2014 an additional 5 kg/ha annual ryegrass seed was spread ahead of seeding & tickled in with a shallow pass with the seeder. The trial consisted of two sowing directions (north-south, east-west) and two cereal varieties (Mace wheat and Commander barley).

All plots were assessed for annual ryegrass plant establishment (8th August) and head number (10th October), grain yield, protein, test weight, screenings with a 2.2 mm screen and retention with a 2.5 mm screen (barley only).

Results and discussion

Plant establishment for both lentil varieties ranged from 117-136 plants per square metre with no effect from stubble direction or height (Table 1). Similarly lentil grain yield was not affected by stubble direction or height at Hart in 2014.

Table 1. The mean plant establishment and grain yield for Blitz and Ace lentils sown at Hart in 2014.

Direction	Stubble	Plant establishment (plants/m ²)		Grain yield (t/ha)	
		Ace	Blitz	Ace	Blitz
East-West	Removed	128	122	2.30	2.35
East-West	Standing	117	118	2.22	2.24
North-South	Removed	137	144	2.42	2.25
North-South	Standing	136	129	2.47	2.43

As observed in the above trial, stubble/sowing direction had no effect on grain yield or quality parameters for Commander barley and Mace wheat. While there was variation in the annual ryegrass plant number and final head count, there was no consistent effect or trend for either of the sowing directions.

Table 2. Summary of grain yield and quality for Mace wheat and Commander barley sown at Hart in 2014 and annual ryegrass plant establishment (8th August) and head number (10th October).

Direction	Variety	Grain yield t/ha	Protein %	Test weight kg/hL	Screenings %	ARG plants/m ²	ARG heads/m ²
East-West	Commander	3.31	11.8	68.9	3.5	86	180
East-West	Mace	2.44	9.6	78.6	3.3	58	158
North-South	Commander	3.51	11.7	69.1	3.3	66	124
North-South	Mace	2.39	9.6	79.6	3.2	86	153
LSD (P≤0.05)							
	Variety	0.56	0.4	2	ns	ns	ns
	Direction	ns	ns	ns	ns	ns	ns