L5. Sowing Time x Stubble Management, MRZ Mid North (Mallala), South Australia

Aim

To maximise yield of new lentil varieties through the identification of optimum sowing dates and stubble management strategies to aid in disease management and harvestability.

Treatments

Varieties:	Boomer, Nipper, Nugget, PBA Blitz, PBA Bounty, PBA Flash, CIPAL0501 and CIPAL0611
Sowing dates:	19 May (Early), 7 June (Mid), 22 June (Late)
Stubble:	2t/ha Barley stubble (30cm high)
Treatments:	Removed (cut at ground height and raked bare just prior to sowing) Slashed (cut at ground height to leave 20-30cm length straw) Standing (30cm high)
Fertiliser:	Map + Zn @ 75kg/ha

Results and Interpretation

Grain yield showed a number of complex, significant interactions between sowing date and stubble treatment, sowing date and variety, and variety plus stubble treatment (see Tables 1 and 2).

Early sown lentils yielded highest or equal highest at this site, averaging 12% better than lentils at the late sowing date. All varieties except PBA Blitz and CIPAL0501 performed better at the early sowing date (Figure L5.1). PBA Blitz showed no difference in yield between early and late sowing dates, and mid and late sowing dates. CIPAL0501 showed no sowing date response. PBA Bounty and PBA Flash were the only varieties that performed better at the mid sowing date than the late sowing date. Nipper showed the biggest penalty from delayed sowing (early sown 18% higher than late sown), while PBA Blitz and CIPAL0501 showed no difference in yield between these sowing dates.

Grain yield was higher in slashed and standing stubble systems at all sowing dates compared to the removed stubble treatment (Table L5.1). There was no difference between yields in standing or slashed stubbles at the early and mid sowing dates. Standing stubble was most effective at the late sowing date, with 15% higher yield than the removed treatment and also 7% higher yield than the slashed stubble treatment. This treatment was able to capture some of the yield loss caused by delayed sowing in this trial.

All varieties except Boomer yielded higher in standing stubbles than where stubbles were removed (Table L5.2). PBA Blitz, PBA Flash, Nipper and Nugget also yielded higher in slashed stubbles than where stubbles were removed. PBA Blitz was the most responsive variety to stubble retention as yield was also greater in standing stubbles than in slashed stubbles in this variety, and standing stubbles performed 22% higher than the removed stubble treatment. Boomer showed no response to either stubble retention treatment.

Lodging reacted significantly to stubble treatment, with lodging worse in standing and slashed stubble treatments compared to the removed stubble treatment (Table L5.3).

Maturity was strongly sowing date responsive, and delayed sowing resulted in a later maturity in all stubble treatments. The various stubble treatments also had a significant affect on maturity scores at the three sowing dates (Table L5.4). At the early sowing date both retained stubble treatments delayed maturity of lentils compared to the removed stubble treatment, and standing stubble showed a later maturity than slashed stubble. At the mid sowing date there was no difference in maturity between the three stubble treatments. Standing stubbles at the late sowing date showed later maturity than both slashed and removed stubble at this sowing date.

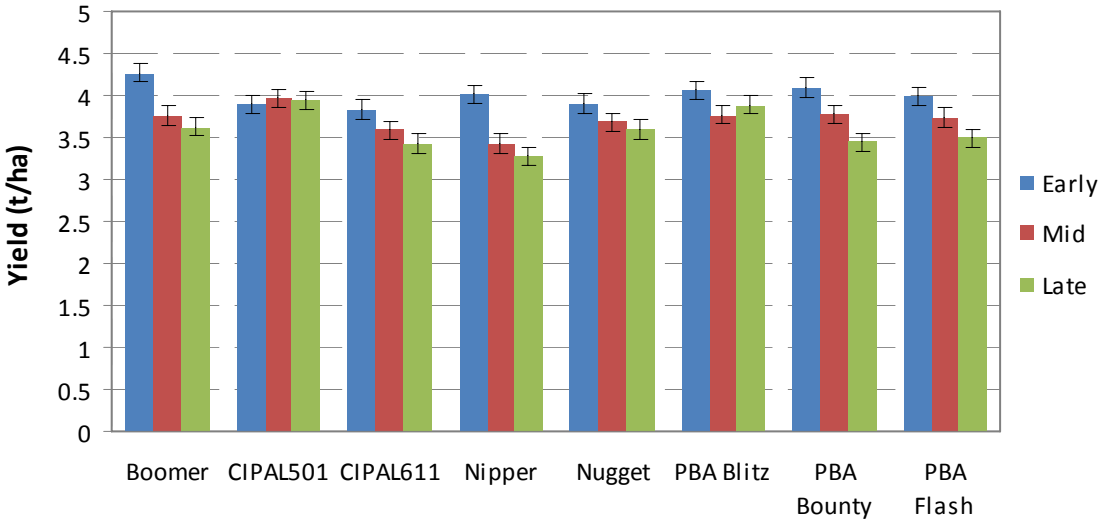

Figure L5.1. Effect of sowing date on grain yield (t/ha) of 8 lentil varieties, Mallala 2010

Table L5.1. Grain yield (t/ha) of lentils at three sowing times and three stubble treatments, Mallala 2010.

Sowing Time	Removed	Retained Slashed	Retained Standing
Early (19 May)	3.91 [c]	4.04 [d]	4.07 [d]
Mid (7 June)	3.47 [a b]	3.80 [c]	3.88 [c]
Late (22 June)	3.33 [a]	3.59 [b]	3.84 [c]
LSD (P<0.05)	**0.17** (0.12 same TOS)		

Table L5.2. Effect of stubble treatment on grain yield (t/ha) of various lentil varieties.

Variety	Removed	Retained Slashed	Retained Standing
Boomer	3.80	3.90	3.96
CIPAL0501	3.83	3.96	4.02
CIPAL0611	3.47	3.64	3.74
Nipper	3.33	3.68	3.72
Nugget	3.52	3.77	3.90
PBA Blitz	3.52	3.92	4.29
PBA Bounty	3.59	3.77	3.96
PBA Flash	3.52	3.84	3.86
LSD (0.05)		0.19	

Table L5.3. Lodging (1-9 score) of lentils at three stubble treatments, Mallala 2010.

Stubble	Removed	Slashed	Standing	LSD (P<0.05)
Lodging Score	6.11	5.69	5.75	0.30

Lodging score: 1 = prostrate, 9 = upright

Table L5.4. Maturity (1-9 score) of lentils at three sowing times and three stubble treatments, Mallala 2010.

Sowing Time	Removed	Retained Slashed	Retained Standing
Early (19 May)	1.8	2.4	2.8
Mid (7 June)	3.2	3.3	3.4
Late (22 June)	4.0	4.0	4.5
LSD (P<0.05)	**0.60** (0.34 same TOS)		

Maturity score: 1 = dead, 9 = healthy

Key Findings and Comments

- Early sown lentils were generally highest yielding, and average 12% higher yield than the late sowing date.
- PBA Blitz and CIPAL0501 showed the least sowing date response in the favourable 2010 growing season.
- Retaining barley stubble at 2t/ha was capable of increasing yield and delaying maturity.
- Stubble retention improved yields at all sowing dates, while standing stubble was most important for grain yield at the later sowing date.
- PBA Blitz was the most responsive variety to stubble retention systems, while Boomer showed no difference in grain yield.
- Lodging was exacerbated in the retained stubble systems.
- Retained stubble delayed maturity, especially at the early sowing date, and may be a result of higher soil moisture in this treatments.
- This trial should be repeated in future seasons in order to compare and validate the 2010 findings across variable growing seasons.