L12 Sowing Time x Disease Management, MRZ Wimmera (Rupanyup), Victoria

Aim

To investigate the adaptability of a range of lentil varieties and variety mixes to varying sowing dates with and without disease management.

Treatments

Varieties: Aldinga, Boomer, Nipper, Northfield, Nugget, PBA Blitz, PBA Flash, PBA Jumbo, CIPAL0801, CIPAL0802, CIPAL0803, CIPAL0901.

Variety Mixes: PBA Flash:Nipper, PBA Flash:Nugget, PBA Flash:PBABlitz, PBA Flash:CIPAL0901. All sown with a 50:50 ratio based on targeted plants/m^2.

Sowing dates: 16 May (Early), 6 June (Mid), 23 June (Late).

Fungicide Regimes:

Regime	Chemical & Application Rate[1]	Timing
Fortnightly	chlorothalonil 500 @ 2 L/ha	Fortnightly starting 6 weeks after emergence.
Nil	Nil	Nil

Other Details

Row Spacing/Stubble: 30 cm row spacing, inter-row, standing stubble.

Fertiliser: MAP + Zn @ 60 kg/ha at sowing.

Plant Density: 120 plants/m^2.

Results of this trial have been presented together with results from trial L13 (Lentil varieties on burnt stubble) to allow comparison between burnt and standing stubble treatments.

Results and Interpretation

- Key Message: Earlier sowing and standing residue was important to maximising grain yield in lentils in the Wimmera. Mid to mid/late maturing varieties like CIPAL0803 and PBA Jumbo, where highest yielding in the 2011 season with mild conditions and significant stored moisture.

- Plant establishment – Establishment for all lentil varieties was adequate in 2011 ranging from 80-110plants/m^2 (data not shown).

- Biomass – Biomass at maturity ranged for 3.8 t/ha to 14 t/ha dependant on sowing date (Table L12.1). There was no effect disease management on biomass, so results presented focus on the overall response across sowing dates. There was a 30% drop in biomass (11.11 t/ha to 7.62 t/ha) from 16 May sown treatments to the 6 June sown treatments and a further 17% drop (to 5.77 t/ha) to the 23 June sown treatments. All varieties generally responded similarly. Boomer had the highest or second highest biomass at all sowing dates, while Northfield generally had the lowest biomass. In the trial conducted on the burnt stubble (see L15 for details) at one sowing date (10 May), biomass was generally 15% less than the standing stubble treatment sown 16 May (Table L12.1). All varieties had similar biomass (9-10t/ha), except PBA Flash and PBA Blitz, which were lower, and CIPAL0803, which was higher, in the trial on the burnt stubble. It was also notable that most varieties matured approximately 10 days earlier than observed in 16 May sown treatment in the standing stubble trial.

- Grain Yield – Grain yields were excellent, indicative of expectations from biomass measurements, and ranged from 1 t/ha for Northfield sown June 23 to 4.6 t/ha for PBAJumbo sown May 16 (Table L14.2). There was no effect disease management on grain yield, so results presented focus on the overall response across sowing dates. The grain yield decrease across sowing dates was highly significant. The June 6 treatments averaged 20% lower yield than May 16, while June 23 treatments were 60% lower yielding than the June 6 treatments. Unlike Curyo the interaction between sowing date and variety was significant, indicating that varieties responded differently across sowing dates. The only varieties or mixes to show no significant difference from the highest yielding variety at all sowing dates, were PBA Jumbo, Nugget,

CIPAL0803, and the mix PBAFlash:CIPAL0901 (Table L12.2). Northfield had significantly lower grain yields at all sowing dates.

In the trial conducted on the burnt stubble at one sowing date (10 May) the average grain yield was 20% less than the standing stubble treatment sown 16 May (Table L12.2), which is similar to delaying sowing to June 6 in standing stubble. CIPAL0901 had the great reduction in grain yield (37%) on the burnt stubble and CIPAL0803 and PBA Jumbo had the least reduction in grain yield (8% and 10%, respectively).

- Grain Weight – Grain weight did not change with delayed sowing for any of the varieties.

Table L12.1. The effect of the interaction between sowing date and lentil variety on biomass (t/ha) sown in standing stubble at Rupanyup in 2011. Results from the variety trial sown on burnt stubble (L13) have been included for comparison in the final column. Each trial was analysed independently and results in table have been ranked according to grain yields from the 16 May sowing date treatment.

Variety / Variety mix	16 May	6 June	23 June	*Average*	Burnt (10 May)
PBAJumbo	12.04	8.13	6.79	*8.99*	10.08
PBAFlash:PBABlitz	11.01	7.20	7.00	*8.40*	9.37
Nugget	13.84	7.92	5.04	*8.93*	9.27
PBAFlash:CIPAL901	9.03	7.78	6.15	*7.65*	9.75
CIPAL0803	11.37	9.62	3.91	*8.30*	12.42
CIPAL0901	11.44	6.99	4.90	*7.78*	9.50
Nipper	10.90	7.30	5.59	*7.93*	8.90
PBAFlash	11.32	8.84	6.51	*8.89*	8.27
PBAFlash:Nugget	11.93	7.59	5.83	*8.45*	9.47
PBABlitz	10.15	5.91	5.80	*7.29*	7.98
PBAFlash:Nipper	8.71	6.34	5.10	*6.72*	9.45
Boomer	13.58	8.43	6.80	*9.60*	9.97
Northfield	10.19	6.52	3.82	*6.84*	9.39
CIPAL0802	11.54	6.81	4.48	*7.61*	9.40
CIPAL0801	8.46	8.35	7.19	*8.00*	9.22
Aldinga	12.25	8.12	7.39	*9.25*	9.29
Average	*11.11*	*7.62*	*5.77*	*8.16*	*9.48*

Trial L14: lsd(P<0.05)SDxVar = NS; lsd(P<0.05)SD = 2.12; lsd(P<0.05)Var = 1.61.
Trial L15: lsd(P<0.05)Var = 1.63

Table L14.2. The effect of the interaction between sowing date and lentil variety on grain yield (t/ha) sown in standing stubble at Rupanyup in 2011. Results from the variety trial sown on burnt stubble (L13) have been included for comparison in the final column. Each trial was analysed independently and results in table have been ranked according to grain yields from the 16 May sowing date treatment. The variety with the highest yield at each sowing date is underlined.

Variety / Variety mix	16 May	6 June	23 June	*Average*	Burnt (10 May)
PBAJumbo	4.60	3.67	2.01	*3.42*	4.11
PBAFlash:PBABlitz	4.51	3.08	1.84	*3.14*	3.69
Nugget	4.51	3.77	1.93	*3.40*	3.18
PBAFlash:CIPAL901	4.49	3.52	1.70	*3.24*	3.46
CIPAL0803	4.41	3.92	1.53	*3.29*	4.04
CIPAL0901	4.39	3.24	1.70	*3.11*	2.75
Nipper	4.31	3.31	1.56	*3.06*	3.43
PBAFlash	4.26	3.13	1.37	*2.92*	3.15
PBAFlash:Nugget	4.19	3.43	1.84	*3.15*	3.52
PBABlitz	4.18	2.96	1.69	*2.94*	3.42
PBAFlash:Nipper	4.17	3.01	1.37	*2.85*	3.50
Boomer	4.09	3.80	1.92	*3.27*	3.32
Northfield	4.06	3.09	1.05	*2.73*	3.07
CIPAL0802	3.89	3.36	1.55	*2.93*	3.32
CIPAL0801	3.77	3.90	1.79	*3.15*	3.35
Aldinga	3.70	3.43	1.59	*2.91*	2.99
Average	*4.22*	*3.41*	*1.65*	*3.09*	*3.39*

Trial L14: lsd(P<0.05)SDxVar = 0.57 except when comparing within a sowing date = 0.48.
Trial L15: lsd(P<0.05)Var = 0.63

Key Findings and Comments

Due to extreme rainfall events during the summer of 2010/11, soil profiles were at or near field capacity at sowing in 2011. Unlike Curyo early growth at Rupanyup was not affected by the dyer period during May and June. Mild temperatures and sufficient rainfall during the main growth periods resulted in excellent grain yields (>4t/ha). The results, similar to Curyo, highlighted that earlier sowing is beneficial in lentils for all varieties. In 2011, the consistently highest yielding varieties PBA Jumbo, CIPAL0803, Nugget where all in the mid to mid/late maturity group, which could be expected given mild seasonal conditions and significant stored moisture. The earlier maturity varieties, which were consistently highest yielding through the drier seasons, generally had slightly lower yields relative to Nugget in 2011. As indicated previously the variety mixes were grown this year to assess whether we could improve yield stability by mixing different types of lentils together, which contain differentiating traits for maturity, and disease resistance. Results from Rupanyup were inconclusive, with no significant difference from the components of the mix in each situation. Further work will occur in 2012 to further investigate these responses.

The trial conducted on the burnt stubble highlighted the importance of residue when seasonal conditions are dry to maintain stored moisture. The main reason for reduced yields was likely to be greater evaporation from the soil surface, as evidenced from the earlier maturity of this trial indicates. The mid maturing varieties CIPAL0803 and PBA Jumbo had the least reduction in grain yield on the burnt stubble, possibly due to their vigorous growth habit earlier in the season.