

7. MFMG High Input Wheat and Barley Trials

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KEY MESSAGES

- MFMG funded variety trials at Conmurra and Millicent on high yield potential wheat and barley lines.
- Released cultivars and experimental lines were evaluated.
- This trial provided growers the opportunity to increase their knowledge on the management and performance of high yield potential wheat and barley varieties for the high rainfall zone (HRZ).
- Trial planning for 2018 is underway focusing on elite lines.

Activities

Trial work in other states suggests there is opportunity in the high rainfall zones to lift productivity and close the gap between actual and potential yields for wheat and barley through matching cultivar phenotype to sowing date and adopting appropriate management including the use of plant growth regulators. Trials were established at two sites (Conmurra and Millicent) in 2017 to evaluate high yield potential wheat and barley varieties in the HRZ of the South East.

Wheat

Fifteen wheat varieties were sown at Conmurra (28 April) and at Millicent (1 May) fourteen wheat varieties were sown. These varieties included released cultivars and experimental lines; Trojan, Manning and Revenue were included as benchmark varieties (different maturities). The seeding rate at both sites was 225 seeds/m².

Barley

Nine barley varieties were sown at Conmurra (7 June) and at Millicent (6 June), at a seeding rate of 165 seeds/m². These varieties included released cultivars and experimental lines with Westminster included as a benchmark variety.

Trial Results

Wheat

At Conmurra, the early sown wheat varieties in this trial yielded on average 6.78 t/ha with yields ranging from 5.76 to 8.40 t/ha (Table 1). Calabro was the highest yielding variety (8.40 t/ha); significantly higher than any other variety.

At Millicent, the mean yield was 9.24 t/ha with yields ranging from 7.37 to 11.10 t/ha (Table 2). Differences in yield were recorded

between varieties. Anapurna was the highest yielding cultivar (11.10 t/ha) and outperformed all other varieties. An assessment was made at harvest of the degree of lodging present at Millicent. This was reported in degrees, with 0° being standing upright and 90° being flat on the ground. Although not analysed, this ranged from 0° through to 77°.

Table 1: 2017 MFMG Conmurra High-input early sown wheat yield and grain quality.

Variety	Yield (t/ha) % Site Mean		1000 grain weight (g/1000 seeds)	Test Weight (kg/hl)	Protein (%)	Screenings (% < 2.00mm)
AGTX002	7.08	104	37.1	74	11.5	2.8
Anapurna	7.39	109	39.4	78	11.8	1.8
Beaufort	6.78	100	35.1	72	12.4	1.2
Calabro	8.40	124	44.7	77	11.7	1.4
CS170	6.89	102	33.3	75	12.0	1.9
Kittyhawk	5.97	88	32.8	74	14.1	2.9
Longsword	7.26	107	37.2	79	12.5	0.7
LPB13-2063	6.04	89	42.2	78	13.2	1.2
LPB14-0392	6.34	94	33.8	76	13.9	2.9
Manning	6.45	95	37.3	72	12.7	2.2
Revenue	6.48	96	34.1	73	11.6	3.4
RGT Accroc	7.15	105	32.8	71	12.8	2.7
Sunlamb	5.76	85	34.6	79	13.9	1.8
Trojan	6.68	99	40.2	80	11.9	0.8
V09150-01	7.03	104	35.0	73	11.8	1.1

Site Mean	6.78
P Value (0.05)	<.001
L.s.d	0.685

Figure 1: Conmurra Hi-input early sown Wheat Trial Site 2017.



Table 2: 2017 MFMG Millicent High-input early sown wheat grain yield and quality.

Variety	Yield (t/ha)	% Site Mean	1000 grain weight (g/1000 seeds)	Test Weight (kg/hl)	Protein (%)	Screenings (% < 2.00mm)	Degree of lodging at Harvest #
AGTW002	10.13	110	42.0	74	10.7	2.7	4
Anapurna	11.10	120	44.0	79	11.7	1.4	12
Beaufort	9.76	106	41.9	77	11.7	1.0	10
Kittyhawk	7.99	86	39.8	80	12.4	1.1	8
LPB13-2063	7.41	80	48.9	80	12.4	1.0	35
LPB14-0392	9.05	98	38.7	78	11.9	0.8	14
Manning	9.99	108	38.5	73	11.7	1.1	0
Longsword	8.36	91	42.7	79	12.5	0.1	10
Revenue	9.91	107	39.2	74	10.5	2.3	60
RGT Accroc	9.88	107	38.0	75	11.6	1.2	77
Calabro	10.03	109	44.9	74	12.1	1.1	55
Sunlamb	7.37	80	33.7	77	13.8	2.2	58
Trojan	9.02	98	46.8	80	11.6	0.4	3
V09150-01	9.33	101	44.7	79	11.9	0.6	7

measurement in degrees, 0° is standing up right,
90° is flat on the ground

Site Mean	9.24
P Value (0.05)	<.001
I.s.d	0.885

Barley

At the Conmurra, the mean yield was 6.38 t/ha and ranged between 5.90 to 6.82 t/ha. The highest yielding variety was Bottler (6.82 t/ha) however there was no difference in yield between varieties in the Conmurra High-input barley trial in 2017.

In contrast, at Millicent, the mean yield was 7.98 t/ha and ranged between 6.33 to 10.09 t/ha. The feed variety, Rosalind, was the highest yielding (10.09 t/ha) outperforming all other varieties except the newly released European cultivar RGT Planet (9.80 t/ha) and Bottler (8.50 t/ha).

Table 3: 2017 MFMG Conmurra High-input barley grain yield and quality.

Variety	Yield t/ha	% Site Mean	1000 grain weight (g/1000 seeds)	Test Weight (kg/hl)	Protein (%)	Retention (% > 2.5 mm)	Screenings (% < 2.2mm)
Bass	6.01	94	47.3	69	13.4	86.5	4.7
Bottler	6.82	107	42.6	68	12.6	86.8	3.1
Capstan	5.99	94	42.6	66	14.7	71.2	8.9
Compass	6.35	100	47.2	66	12.3	89.4	2.3
Oxford	6.77	106	38.0	67	13.8	74.4	6.8
RGT Planet	6.75	106	45.2	65	12.2	86.2	3.4
Rosalind	6.50	102	43.2	67	13.4	81.1	5.0
Spartacus CL	6.32	99	40.2	69	13.7	83.6	4.6
Westminster	5.90	92	45.7	67	13.5	88.3	2.6

Site Mean	6.38
P Value (0.05)	0.099
I.s.d	NS
CV%	3.8

NS = Not Significant

Table 4: 2017 MFMG Millicent High-input barley grain yield and quality.

Variety	Yield t/ha	% Site Mean	1000 grain weight (g/1000 seeds)	Test Weight (kg/hl)	Protein (%)	Retention (% > 2.5 mm)	Screenings (% < 2.2mm)
Bass	7.04	88	45.5	68	13.7	89.2	2.6
Bottler	8.50	106	47.3	67	12.8	95.5	0.7
Capstan	6.61	83	46.2	67	14.3	86.3	2.7
Compass	7.83	98	45.9	66	13.0	90.8	1.8
Oxford	6.33	79	39.2	63	12.8	79.1	3.8
RGT Planet	9.80	123	48.8	64	11.9	92.5	0.9
Rosalind	10.09	126	43.7	66	12.6	90.0	1.2
Spartacus CL	7.41	93	42.2	66	14.0	84.2	3.8
Westminster	8.23	103	49.2	67	13.3	94.5	0.7
Site Mean	7.98						
P Value (0.05)	0.001						
I.s.d	1.75						

Conclusions

This trial provided growers in the HRZ of the SE the opportunity to increase their knowledge on the performance and management of high yield potential wheat and barley varieties. The data produced in this trial needs to be considered in the context of the 2017 season and level of trial inputs. Waterlogging and frost events occurred at both sites; with variation in flowering date across varieties this is an important factor to be considered. Furthermore, differences were observed in variety performance at Conmurra and Millicent that reflect the longer growing season

and higher rainfall at the latter site. Trial work in other states suggests that selecting cultivars with the correct phenology for the chosen sowing date is essential in order to match crop development to the optimal environmental conditions for growth. This, in combination with disease resistance and cultivar standing power (and use of plant growth regulators), has been shown to be a key ingredient for achieving higher yields in the HRZ. Trial planning is underway further evaluate an elite cohort of high yielding wheat and barley cultivars in 2018.



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