

Dual purpose grazing cereal evaluation in NSW

Trial report 2016



Project background

Research project:

DAN00184: Evaluation and agronomic management of dual-purpose cereal varieties for NSW mixed farming systems.

Partnership between NSW DPI and GRDC.

Project target:

The aim is to improve profitability in dual-purpose grazing cereal systems in the mixed farming zone of NSW. It is envisaged that these profitability gains will come through adopting superior dual-purpose varieties identified through the project, and more precise grazing/stocking rate decisions that will be underpinned by better understanding the role of plant development, phenology and sowing time on dry matter production, grain yield and grain quality.

Project staff:

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2016 research locations NSW:

Bathurst, Cudal, Holbrook, Purllewaugh, Somerton, Spicers Creek and Wagga Wagga

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Caution

These results are the individual trial results from the 2016 cereal grazing trials in NSW and should be viewed with caution. They represent the varieties' performance in the 2016 season, at the specific sites where the trials were conducted. Before making any decision regarding variety performance, the variety's performance should be viewed over a number of seasons and sites.

Seasonal summary 2016

The 2016 season began with a drier than normal start, which delayed sowing the variety trials across NSW; sowing dates ranged from 5 April at Bathurst through to 6 May at Somerton. Following the drier start, weather conditions changed in mid May, with most areas receiving above average winter rainfall (see Table 1). These wet and cold conditions hampered growth at some sites through winter as the soil was wet for prolonged periods. This was particularly evident at the Holbrook site where the barley and oat variety recovery from grazing during this period was adversely affected.

The trend for above average rainfall continued into September with some sites receiving more than double their normal long-term average for the month. October rainfall in most areas was also above average. This rainfall and milder spring conditions supported recovery from grazing, grain development and filling.

The higher than normal number of overcast days through winter also affected the development of some varieties that rely on a photoperiod response (daylight hours) to shift from vegetative growth into reproductive development. This delay, fortunately in 2016, was buffered by the above average rainfall and milder conditions in spring that allowed many of the longer season varieties to fill grain through late spring and not be affected by the usual hotter and drier conditions at many locations.

Measuring dry matter production and grazing by sheep was targeted at two periods: mid tillering and at the end of tillering before stem elongation (growth stage Z30–31 on the Zadoks scale). The industry benchmark, EGA_Wedgetail[Ⓢ], was used as the indicator variety for when grazing was to occur. The wet weather through late winter hindered trial site access and the opportunity to graze sites for the second time without causing damage to plots by stock trampling and pugging at the sites. At a number of the sites, EGA_Wedgetail[Ⓢ] had moved past the Z30–31 developmental stage once sites were accessible and these sites were not grazed to avoid tiller loss and plant damage.

As part of the experiment protocols a number of main season crop varieties such as EGA_Gregory[Ⓢ], DS Pascal[Ⓢ] and Tuckerbox were included. These would not normally be used as a grazing cereal variety and producers should view this data with caution as the 2016 season was favourable for their recovery after grazing. In lower rainfall years, crop damage and yield losses can be significant when grazed past stem elongation.

In the 2016 season, 48 entries were tested in multispecies trials (wheat, barley and triticale) and 34 oat varieties at seven locations in NSW. In this report, only data from commercially released varieties have been included. In each of the trial results tables, a rank has been included on the relative performance of the varieties across all entries in the trial to use as a comparison between trials.

Rainfall

Table 1. Monthly rainfall for trial sites in NSW for 2016 and the long-term average (LTA) (mm) for the closest Bureau of Meteorology weather site.

	Bathurst			Cudal			Holbrook			Purlewaugh		
Month	LTA	2016	Difference LTA	LTA	2016	Difference LTA	LTA	2016	Difference LTA	LTA	2016	Difference LTA
January	68	105	37	63	49	-14	45	75	30	90	111	21
February	58	13	-45	53	0	-53	66	28	-38	81	23	-58
March	52	40	-12	52	47	-5	54	24	-31	63	35	-28
April	42	23	-19	44	58	14	42	16	-26	52	18	-34
May	41	39	-3	47	63	16	49	100	51	54	63	10
June	44	104	59	53	122	69	67	94	27	57	126	69
July	49	105	56	53	95	42	67	80	13	55	39	-16
August	50	88	39	52	78	26	70	69	-2	53	74	22
September	47	139	92	49	163	114	64	147	83	51	183	132
October	59	49	-10	56	53	-3	54	45	-9	59	63	4
November	61	60	-1	54	57	3	61	37	-24	65	20	-45
December	66	45	-21	59	24	-35	45	43	-2	71	33	-38
Total	640	810	170	636	809	173	714	756	41	751	788	37

Table 1. (continued) Monthly rainfall for trial sites in NSW for 2016 and the long-term average (LTA) (mm) for the closest Bureau of Meteorology weather site.

	Somerton			Spicers Creek			Wagga Wagga		
Month	LTA	2016	Difference LTA	LTA	2016	Difference LTA	LTA	2016	Difference LTA
January	79	97	18	72	88	17	38	59	20.8
February	64	18	-46	61	0	-61	37	20	-16.9
March	43	2	-41	53	46	-7	38	43	5.0
April	34	2	-32	45	19	-26	39	11	-27.7
May	39	80	41	47	63	16	44	102	58.2
June	41	124	84	52	108	56	51	100	48.9
July	38	33	-5	52	95	43	49	87	37.4
August	37	101	64	51	76	25	48	68	19.9
September	39	122	83	48	162	114	49	178	129.2
October	53	65	12	56	79	23	51	79	27.7
November	60	10	-50	64	37	-27	41	28	-13.1
December	66	38	-28	61	26	-35	41	54	12.3
Total	594	693	99	656	798	141	527	827	300.5

Wheat, triticale and barley variety performance

Table 2. Dual-purpose wheat, triticale and barley grazing trial dry matter, grain yield and quality results at Bathurst in 2016.

Variety	Crop type	DM1 (kg/ha)	Rank	Percentage of EGA_Wedgetail	DM2 (kg/ha)	Rank	Percentage of EGA_Wedgetail	Grain yield (kg/ha)	Rank	Percentage of EGA_Wedgetail	Protein %	Max. Classification	Screenings %
Urambie	Barley	4290	4	120	3654	18	107	6400	24	90	9.2	Feed	–
Cartwheel	Triticale	3778	18	106	3696	17	109	6342	25	89	11.4	Feed	0.1
Crackerjack2	Triticale	4630	1	129	3449	25	101	4990	41	70	11.6	Feed	0.5
Endeavour	Triticale	4272	5	119	4058	7	119	7016	11	99	10.3	Feed	0.2
Tobruk	Triticale	3293	40	92	3928	10	115	5794	32	82	11.2	Feed	0.2
Tuckerbox	Triticale	3478	31	97	2434	44	72	6034	28	85	9.6	Feed	0.3
DS_Pascal	Wheat	3506	30	98	1907	48	56	3690	47	52	13.7	APW	0.2
EGA_Gregory	Wheat	4391	2	123	2092	46	62	4110	46	58	13.3	APH	0.2
EGA_Wedgetail	Wheat	3579	24	100	3401	26	100	7104	9	100	12.7	APH	0.1
LRPB Kittyhawk	Wheat	3442	33	96	3722	15	109	–	–	–	14.1	–	0.1
Mackellar	Wheat	3079	46	86	3324	27	98	6414	23	90	11.2	Feed	0.7
Manning	Wheat	3813	17	107	3306	28	97	7474	3	105	9.9	Feed	0.3
Naparoo	Wheat	3413	34	95	3939	9	116	5750	34	81	11.8	Feed	0.2
RGT_Accroc	Wheat	3100	45	87	3132	35	92	7283	5	103	10.6	Feed	0.1
SF_Adagio	Wheat	3459	32	97	2845	38	84	6949	13	98	12.1	Feed	0.2
SF_Scenario	Wheat	4069	9	114	4015	8	118	7170	7	101	11.5	Feed	0.1
Sunlamb	Wheat	3283	41	92	2753	43	81	6449	22	91	11.3	ASW	0.2
Sunmax	Wheat	3650	23	102	2816	41	83	5654	37	80	12.3	APH	0.3
Trial mean		3631			3384			6127			11.6		0.3
LSD 5%		845			640			666			0.8		0.1
P-value		<0.001			<0.001			<0.001			<0.001		<0.001
CV		14			10			6			3.2		15.4
Sowing date		5 Apr 16											
Harvest date		22 Dec 16											
Dry matter measurement date		22 Jun 16			23 Aug 16								
Grazing date		23 Jun 16			Not grazed								

Table 3. Dual-purpose wheat, triticale and barley grazing trial dry matter and grain yield and quality results at Cudal in 2016.

Variety	Crop type	DM1 (kg/ha)	Rank	Percentage of EGA_Wedgetail	DM2 (kg/ha)	Rank	Percentage of EGA_Wedgetail	Grain yield (kg/ha)	Rank	Percentage of EGA_Wedgetail	Protein %	Max. Classification	Screenings %
Urambie	Barley	1751	16	94	2599	13	100	7755	17	103	10.8	Feed	–
Cartwheel	Triticale	1645	28	89	2488	18	96	8864	5	118	11.9	Feed	0.2
Crackerjack2	Triticale	1865	11	101	2222	30	85	5525	47	73	13.3	Feed	0.2
Endeavour	Triticale	2112	1	114	2773	6	107	7352	26	98	12.3	Feed	0.1
Tobruk	Triticale	1553	33	84	3165	2	122	8297	10	110	11.2	Feed	0.2
Tuckerbox	Triticale	1838	13	99	1174	47	45	4943	48	66	11.0	Feed	0.4
DS_Pascal	Wheat	1565	32	84	1528	44	59	7318	29	97	12.7	APW	0.2
EGA_Gregory	Wheat	1692	24	91	1439	46	55	6387	46	85	12.6	APH	0.2
EGA_Wedgetail	Wheat	1853	12	100	2604	12	100	7524	23	100	13.8	APH	0.2
LRPB Kittyhawk	Wheat	2029	3	110	2164	32	83	7201	33	96	12.7	APH	0.2
Mackellar	Wheat	1448	42	78	2144	35	82	7006	37	93	13.5	Feed	0.8
Manning	Wheat	1685	25	91	2336	22	90	6634	41	88	13.0	Feed	0.3
Naparoo	Wheat	1910	7	103	2303	25	88	6504	45	86	12.9	Feed	0.3
RGT_Accroc	Wheat	1987	6	107	2451	20	94	8113	13	108	12.6	Feed	0.1
SF_Adagio	Wheat	1575	31	85	2330	24	90	8348	9	111	12.9	Feed	0.2
SF_Scenario	Wheat	1884	9	102	2250	27	86	6908	39	92	14.3	Feed	0.1
Sunlamb	Wheat	1631	29	88	1915	38	74	6626	43	88	14.5	ASW	0.4
Sunmax	Wheat	1551	34	84	1583	43	61	7024	36	93	13.7	APH	0.3
Trial mean		1679		2284		7551		12.6		0.3			
LSD 5%		441		406		632		0.7		0.1			
P-value		0.003		<0.001		<0.001		<0.001		<0.001			
CV		16		11		5		2.5		15.7			
Sowing date		20 Apr 16				NPA16COWA2							
Harvest date		18 Dec 16											
Dry matter measurement date		22 Jun 16		16 Aug 16									
Grazing date		22 Jun 16		Not grazed									

Table 4. Dual-purpose wheat, triticale and barley grazing trial dry matter and grain yield and quality results at Holbrook in 2016.

Variety	Crop type	DM1 (kg/ha)	Rank	Percentage of EGA_Wedgetail	DM2 (kg/ha)	Rank	Percentage of EGA_Wedgetail	Grain yield (kg/ha)	Rank	Percentage of EGA_Wedgetail	Protein %	Max. Classification	Screenings %
Urambie	Barley	595	47	44	373	47	37	1926	47	36	11.5	Feed	–
Cartwheel	Triticale	1463	12	107	1101	11	110	6648	10	125	11.2	Feed	2.4
Crackerjack2	Triticale	1498	9	110	1027	14	102	4134	42	77	12.5	Feed	1.6
Endeavour	Triticale	1492	10	109	1220	5	121	5818	15	109	11.7	Feed	0.6
Tobruk	Triticale	1559	6	114	1204	6	120	7775	2	146	9.9	Feed	2.4
Tuckerbox	Triticale	2020	1	148	1114	8	111	4923	27	92	10.9	Feed	1.9
DS_Pascal	Wheat	1322	22	97	714	32	71	4789	29	90	12.2	APW	0.3
EGA_Gregory	Wheat	1202	26	88	660	37	66	4134	41	77	12.8	APH	0.2
EGA_Wedgetail	Wheat	1368	19	100	1005	15	100	5337	21	100	13.3	APH	0.1
LRPB Kittyhawk	Wheat	1325	21	97	907	23	90	4187	40	78	13.5	APH	0.1
Mackellar	Wheat	874	43	64	617	39	61	4563	33	85	12.4	Feed	7.6
Manning	Wheat	1383	17	101	805	28	80	6311	14	118	11.7	Feed	1.7
Naparoo	Wheat	1184	30	87	809	27	80	4880	28	91	11.7	Feed	2.1
RGT_Accroc	Wheat	1202	27	88	923	20	92	6831	7	128	11.5	Feed	0.7
SF_Adagio	Wheat	953	40	70	825	26	82	5014	26	94	12.2	Feed	1.2
SF_Scenario	Wheat	1052	33	77	613	40	61	4606	32	86	12.7	Feed	0.2
Sunlamb	Wheat	1375	18	101	780	30	78	5506	17	103	12.8	ASW	2.4
Sunmax	Wheat	1543	7	113	897	24	89	5488	18	103	13.4	APH	0.5
Trial mean		1260			885			5343			12.0		1.3
LSD 5%		200			169			951			0.7		0.3
P-value		<0.001			<0.001			<0.001			<0.001		<0.001
CV		10			11			10			2.3		26.7
Sowing date		4 May 16					NPA16CULC2						
Harvest date		20 Dec 16											
Dry matter measurement date		18 Jul 16			18 Aug 16								
Grazing date		20 Jul 16			Not grazed								

Table 5. Dual-purpose wheat, triticale and barley grazing trial dry matter and grain yield and quality results at Purlewaugh in 2016.

Variety	Crop type	DM1 (kg/ha)	Rank	Percentage of EGA_Wedgetail	DM2 (kg/ha)	Rank	Percentage of EGA_Wedgetail	Grain yield (kg/ha)	Rank	Percentage of EGA_Wedgetail	Protein %	Max. Classification	Screenings %
Urambie	Barley	2883	25	90	2543	14	104	5770	8	127	11.0	Feed	3.5
Cartwheel	Triticale	2882	26	90	2669	12	109	4555	43	100	10.9	Feed	0.0
Crackerjack2	Triticale	2708	36	85	2150	34	88	5132	35	113	11.7	Feed	0.3
Endeavour	Triticale	3097	19	97	2406	21	98	6045	3	133	11.5	Feed	0.1
Tobruk	Triticale	3293	12	103	3124	7	128	5192	26	114	10.7	Feed	0.1
Tuckerbox	Triticale	3766	2	118	1229	47	50	4957	37	109	10.4	Feed	2.4
DS_Pascal	Wheat	3224	13	101	1426	45	58	5464	14	120	11.8	APW	0.3
EGA_Gregory	Wheat	3649	3	114	1347	46	55	5779	7	127	11.5	APH	0.1
EGA_Wedgetail	Wheat	3200	15	100	2449	15	100	4548	44	100	12.7	APH	0.0
LRPB Kittyhawk	Wheat	2661	37	83	2429	17	99	5218	25	115	12.1	APH	0.0
Mackellar	Wheat	2041	47	64	2427	18	99	5176	27	114	11.5	Feed	4.6
Manning	Wheat	2861	29	89	2256	32	92	5507	13	121	11.1	Feed	3.4
Naparoo	Wheat	3356	9	105	2323	27	95	5373	18	118	10.8	Feed	2.3
RGT_Accroc	Wheat	3002	23	94	2383	23	97	6000	4	132	11.3	Feed	1.0
SF_Adagio	Wheat	2579	41	81	2281	28	93	5086	36	112	11.3	Feed	0.5
SF_Scenario	Wheat	3323	11	104	2373	24	97	5253	21	115	12.4	Feed	2.1
Sunlamb	Wheat	2575	42	80	1897	38	77	5560	10	122	11.7	ASW	1.5
Sunmax	Wheat	3627	4	113	1812	39	74	5220	24	115	12.0	APH	0.5
Trial mean		2989			2379			5243			11.5		1.2
LSD 5%		713			450			896			0.5		1.0
P-value		<0.001			<0.001			<0.001			<0.001		<0.001
CV		15			11			11			2.7		30.4
Sowing date		20 Apr 16					NPA16PURL2						
Harvest date		14 Dec 16											
Dry matter measurement date		13 Jul 16			18 Aug 16								
Grazing date		14 Jul 16			Not grazed								

Table 8. Dual-purpose wheat, triticale and barley grazing trial dry matter and grain yield and quality results at Wagga Wagga in 2016.

Variety	Crop type	DM1 (kg/ha)	Rank	Percentage of EGA_Wedgetail	DM2 (kg/ha)	Rank	Percentage of EGA_Wedgetail	Grain yield (kg/ha)	Rank	Percentage of EGA_Wedgetail	Protein %	Max. Classification	Screenings %
Urambie	Barley	1422	29	89	1451	24	94	4802	23	112	8.6	Feed	9.6
Cartwheel	Triticale	1417	30	88	1566	9	102	5911	4	138	9.2	Feed	0.8
Crackerjack2	Triticale	1559	12	97	1512	19	98	2976	48	70	10.4	Feed	3.0
Endeavour	Triticale	1554	14	97	1558	11	101	4516	25	106	9.8	Feed	0.6
Tobruk	Triticale	1438	26	90	1533	15	99	5826	5	136	8.9	Feed	1.0
Tuckerbox	Triticale	2042	1	128	1260	39	82	3325	47	78	9.9	Feed	3.3
DS_Pascal	Wheat	1433	27	89	1170	45	76	4414	27	103	10.4	APW	0.6
EGA_Gregory	Wheat	1450	25	91	1118	48	73	3859	40	90	10.3	APH	0.7
EGA_Wedgetail	Wheat	1601	6	100	1543	13	100	4273	29	100	10.1	APH	0.5
LRPB Kittyhawk	Wheat	1489	20	93	1453	23	94	3364	46	79	10.0	APH	0.7
Mackellar	Wheat	916	47	57	1146	46	74	5100	16	119	10.6	Feed	12.7
Manning	Wheat	1323	38	83	1342	29	87	5480	9	128	9.9	Feed	4.2
Naparoo	Wheat	1495	19	93	1787	2	116	4250	31	99	10.0	Feed	5.6
RGT_Accroc	Wheat	1577	7	98	1415	25	92	6356	1	149	9.4	Feed	1.3
SF_Adagio	Wheat	1249	43	78	1319	35	85	5524	7	129	9.8	Feed	0.7
SF_Scenario	Wheat	1283	39	80	1201	43	78	5211	14	122	10.8	Feed	1.6
Sunlamb	Wheat	1431	28	89	1335	31	87	3835	41	90	10.8	ASW	2.2
Sunmax	Wheat	1663	4	104	1307	36	85	4199	33	98	10.2	APH	0.7
Trial mean		1433			1424			4656			9.9		2.9
LSD 5%		195			258			539			0.9		0.9
P-value		<0.001			<0.001			<0.001			<0.001		<0.001
CV		10			13			8			4.0		10.5
Sowing date		2 May 16											
Harvest date		15 Dec 16											
Dry matter measurement date		12 Jul 16											
Grazing date		13 Jul 16											
NPATOS16WARI2													

Table 13. Dual-purpose oat grazing trial dry matter and grain yield and quality results at Somerton in 2016.

[illegible]

Economic comparison

An economic comparison has been undertaken and included in this report for four of the experimental sites in 2016. This compares varieties based on the potential gross return, valuing both forage production and grain. When growers are comparing crop types and varieties they need to undertake this type of comparison to place a value on the forage production from the grazing crop in their own farming business and not only look at the returns from grain production.

To allow this comparison to occur, a number of assumptions were made: the conversion factor for converting forage to livestock live weight; value of livestock (lamb) based on increase in live weight; forage residual and losses; and the price of grain. Where possible, producers should use local prices for both livestock and grain, as these can significantly affect the potential gross income from different crop types and varieties.

For the following comparisons these variables have been set at a common value:

1. Conversion rate – 10 to 1 (kg DM to kg LWT), this will vary depending on the type and quality of feed on offer.
2. Forage losses from grazing – 20%. This will vary depending on the type of grazing practice and potential spoilage from livestock.
3. Residual forage left after grazing – 800 kg DM/ha per grazing event.
4. Value of lamb live weight gain – \$3.00 kg. Highly market-dependent on the class of lamb, sale method and time of year.
5. Grain prices – based on grain delivered to the regional silo. These will vary depending on delivery site and regional demand for grain type. For each of the sites the grain price has been adjusted based on maximum deliverable grade and physical grain quality (protein and screenings) of the variety in the experiment.

Table 16. Grain price for economic analysis tables by crop type and classification (sourced March 2016).

Grain type	Classification/grade	Price (\$/tonne)	Delivery site
Oat	Feed	130	Dubbo
Triticale	Feed	150	Cowra
Barley	Feed	140	Dubbo
Wheat	Feed	145	Parkes
	ASW	170	Parkes
	APW	177	Parkes
	AH	204	Parkes
	APH	277	Parkes

Bathurst

Table 17. Economic comparison of dual-purpose wheat, triticale and barley grazing trial results at Bathurst in 2016.

Variety	Crop type	DM1 (kg/ha)	DM2 (kg/ha)	Total DM	DM minus field losses & residual	Conversion rate (kg DM to kg LWT)	Total liveweight produced (kg LWT/ha)	Liveweight value (\$/kg)	Total LWT value (\$/ha)	Grain yield (kg/ha)	Price (adjusted for del. grade) (\$/tonne)	Grain value (\$/ha)	Gross return (\$/ha)
Urambie	Barley	4290	3654	7944	4756	10	476	3	1427	6400	140	896	2323
Cartwheel	Triticale	3778	3696	7474	4379	10	438	3	1314	6342	150	951	2265
Crackerjack2	Triticale	4630	3449	8078	4863	10	486	3	1459	4990	150	749	2207
Endeavour	Triticale	4272	4058	8329	5063	10	506	3	1519	7016	150	1052	2571
Tobruk	Triticale	3293	3928	7221	4176	10	418	3	1253	5794	150	869	2122
Tuckerbox	Triticale	3478	2434	5912	3130	10	313	3	939	6034	150	905	1844
DS_Pascal	Wheat	3506	1907	5413	2730	10	273	3	819	3690	177	653	1472
EGA_Gregory	Wheat	4391	2092	6483	3587	10	359	3	1076	4110	227	933	2009
EGA_Wedgetail	Wheat	3579	3401	6981	3985	10	398	3	1195	7104	204	1449	2645
LRPB Kittyhawk	Wheat	3442	3722	7163	4131	10	413	3	1239	–	–	–	–
Mackellar	Wheat	3079	3324	6403	3523	10	352	3	1057	6414	145	930	1987
Manning	Wheat	3813	3306	7118	4095	10	409	3	1228	7474	145	1084	2312
Naparoo	Wheat	3413	3939	7352	4282	10	428	3	1284	5750	145	834	2118
RGT_Accroc	Wheat	3100	3132	6232	3386	10	339	3	1016	7283	145	1056	2072
SF_Adagio	Wheat	3459	2845	6304	3443	10	344	3	1033	6949	145	1008	2041
SF_Scenario	Wheat	4069	4015	8084	4867	10	487	3	1460	7170	145	1040	2500
Sunlamb	Wheat	3283	2753	6036	3229	10	323	3	969	6449	170	1096	2065
Sunmax	Wheat	3650	2816	6467	3573	10	357	3	1072	5654	204	1153	2225

Table 18. Economic comparison of dual-purpose oat grazing trial results at Bathurst in 2016.

Variety	Crop type	DM1 (kg/ha)	DM2 (kg/ha)	Total DM	DM minus field losses and residual	Conversion rate (kg DM to kg LWT)	Total liveweight produced (kg LWT/ha)	Liveweight value (\$/kg)	Total LWT value (\$/ha)	Grain yield (kg/ha)	Price (adjusted for del. grade) (\$/tonne)	Grain value (\$/ha)	Gross return (\$/ha)
Aladdin	Oat	2067	2689	4756	2205	10	220	3	661	4025	130	523	1185
Bass	Oat	–	–	–	–	–	–	–	–	–	–	–	–
Bimbil	Oat	3170	3885	7055	4044	10	404	3	1213	4384	130	570	1783
Bond	Oat	2867	3243	6110	3288	10	329	3	986	4485	130	583	1570
Boss	Oat	2412	2213	4625	2100	10	210	3	630	4463	130	580	1210
EGA_Wedgetail	Wheat	2964	4027	6991	3993	10	399	3	1198	6803	204	1388	2586
Empire	Oat	2672	2101	4773	2219	10	222	3	666	4495	130	584	1250
Endeavour	Triticale	3096	4290	7386	4309	10	431	3	1293	6278	150	942	2235
Eurabbie	Oat	2533	3376	5909	3127	10	313	3	938	5699	130	741	1679
Genie	Oat	2286	2852	5138	2510	10	251	3	753	3542	130	460	1214
Graza 85	Oat	–	–	–	–	–	–	–	–	–	–	–	–
Mammoth	Oat	2189	3096	5285	2628	10	263	3	788	3771	130	490	1279
Mannus	Oat	2004	2867	4871	2296	10	230	3	689	3786	130	492	1181
Nile	Oat	3270	3155	6425	3540	10	354	3	1062	3976	130	517	1579
Savannah	Oat	1969	1956	3925	1540	10	154	3	462	3586	130	466	928
SF_Colossus	Oat	2098	3222	5320	2656	10	266	3	797	3298	130	429	1226
SF_Tucana	Oat	2652	2734	5386	2709	10	271	3	813	3343	130	435	1247
Yarran	Oat	3355	3337	6692	3753	10	375	3	1126	4702	130	611	1737
Yiddah	Oat	3231	3334	6565	3652	10	365	3	1095	4230	130	550	1645

Cudal

Table 19. Economic comparison of dual-purpose wheat, triticale and barley grazing trial results at Cudal in 2016.

Variety	Crop type	DM1 (kg/ha)	DM2 (kg/ha)	Total DM	DM minus field losses and residual	Conversion rate (kg DM to kg LWT)	Total liveweight produced (kg LWT/ha)	Liveweight value (\$/kg)	Total LWT value (\$/ha)	Grain yield (kg/ha)	Price (adjusted for del. grade) (\$/tonne)	Grain value (\$/ha)	Gross return (\$/ha)
Urambie	Barley	1751	2599	4349	1879	10	188	3	564	7755	140	1086	1650
Cartwheel	Triticale	1645	2488	4133	1706	10	171	3	512	8864	150	1330	1841
Crackerjack2	Triticale	1865	2222	4087	1669	10	167	3	501	5525	150	829	1330
Endeavour	Triticale	2112	2773	4885	2308	10	231	3	692	7352	150	1103	1795
Tobruk	Triticale	1553	3165	4719	2175	10	218	3	653	8297	150	1245	1897
Tuckerbox	Triticale	1838	1174	3012	810	10	81	3	243	4943	150	742	984
DS_Pascal	Wheat	1565	1528	3093	874	10	87	3	262	7318	177	1295	1558
EGA_Gregory	Wheat	1692	1439	3132	905	10	91	3	272	6387	204	1303	1574
EGA_Wedgetail	Wheat	1853	2604	4456	1965	10	197	3	590	7524	227	1708	2298
LRPB Kittyhawk	Wheat	2029	2164	4193	1754	10	175	3	526	7201	204	1469	1995
Mackellar	Wheat	1448	2144	3592	1274	10	127	3	382	7006	145	1016	1398
Manning	Wheat	1685	2336	4020	1616	10	162	3	485	6634	145	962	1447
Naparoo	Wheat	1910	2303	4213	1770	10	177	3	531	6504	145	943	1474
RGT_Accroc	Wheat	1987	2451	4438	1951	10	195	3	585	8113	145	1176	1762
SF_Adagio	Wheat	1575	2330	3906	1525	10	152	3	457	8348	145	1210	1668
SF_Scenario	Wheat	1884	2250	4134	1707	10	171	3	512	6908	145	1002	1514
Sunlamb	Wheat	1631	1915	3546	1237	10	124	3	371	6626	170	1127	1498
Sunmax	Wheat	1551	1583	3134	907	10	91	3	272	7024	227	1594	1867

Table 20. Economic comparison of dual-purpose oat grazing trial results at Cudal in 2016.

Variety	Crop type	DM1 (kg/ha)	DM2 (kg/ha)	Total DM	DM minus field losses & residual	Conversion rate (kg DM to kg LWT)	Total liveweight produced (kg LWT/ha)	Liveweight value (\$/kg)	Total LWT value (\$/ha)	Grain yield (kg/ha)	Price (adjusted for del. grade) (\$/tonne)	Grain value (\$/ha)	Gross return (\$/ha)
Aladdin	Oat	1315	1604	2918	735	10	73	3	220	3794	130	493	714
Bass	Oat	–	–	–	–	–	–	–	–	–	–	–	–
Bimbil	Oat	2396	2508	4903	2323	10	232	3	697	5099	130	663	1360
Bond	Oat	1839	1986	3826	1460	10	146	3	438	4655	130	605	1043
Boss	Oat	2236	1684	3920	1536	10	154	3	461	4179	130	543	1004
EGA_Wedgetail	Wheat	2625	2473	5098	2478	10	248	3	743	5377	204	1097	1840
Empire	Oat	1275	1805	3080	864	10	86	3	259	3923	130	510	769
Endeavour	Triticale	2545	1958	4503	2002	10	200	3	601	6384	150	958	1558
Eurabbie	Oat	2169	2969	5138	2511	10	251	3	753	4545	130	591	1344
Genie	Oat	2481	1984	4464	1972	10	197	3	591	3205	130	417	1008
Graza 85	Oat	–	–	–	–	–	–	–	–	–	–	–	–
Mammoth	Oat	1958	2416	4374	1899	10	190	3	570	4167	130	542	1111
Mannus	Oat	1956	2274	4231	1785	10	178	3	535	5777	130	751	1286
Nile	Oat	2756	2713	5470	2776	10	278	3	833	3658	130	475	1308
Savannah	Oat	2055	1768	3823	1458	10	146	3	437	3721	130	484	921
SF_Colossus	Oat	2866	2162	5029	2423	10	242	3	727	2175	130	283	1010
SF_Tucana	Oat	2635	2618	5252	2602	10	260	3	781	2676	130	348	1128
Yarran	Oat	1985	2127	4113	1690	10	169	3	507	4391	130	571	1078
Yiddah	Oat	2005	2763	4768	2215	10	221	3	664	5323	130	692	1356

Purlewaugh

Table 21. Economic comparison of dual-purpose wheat, triticale and barley grazing trial results at Purlewaugh in 2016.

Variety	Crop type	DM1 (kg/ha)	DM2 (kg/ha)	Total DM	DM minus field losses & residual	Conversion rate (kg DM to kg LWT)	Total liveweight produced (kg LWT/ha)	Liveweight value (\$/kg)	Total LWT value (\$/ha)	Grain yield (kg/ha)	Price (adjusted for del. grade) (\$/tonne)	Grain value (\$/ha)	Gross return (\$/ha)
Urambie	Barley	2883	2543	5426	2741	10	274	3	822	5770	140	808	1630
Cartwheel	Triticale	2882	2669	5551	2841	10	284	3	852	4555	150	683	1536
Crackerjack2	Triticale	2708	2150	4857	2286	10	229	3	686	5132	150	770	1455
Endeavour	Triticale	3097	2406	5503	2803	10	280	3	841	6045	150	907	1748
Tobruk	Triticale	3293	3124	6417	3534	10	353	3	1060	5192	150	779	1839
Tuckerbox	Triticale	3766	1229	4994	2395	10	240	3	719	4957	150	743	1462
DS_Pascal	Wheat	3224	1426	4650	2120	10	212	3	636	5464	177	967	1603
EGA_Gregory	Wheat	3649	1347	4995	2396	10	240	3	719	5779	204	1179	1898
EGA_Wedgetail	Wheat	3200	2449	5649	2919	10	292	3	876	4548	204	928	1804
LRPB Kittyhawk	Wheat	2661	2429	5089	2472	10	247	3	741	5218	204	1064	1806
Mackellar	Wheat	2041	2427	4469	1975	10	197	3	592	5176	145	750	1343
Manning	Wheat	2861	2256	5116	2493	10	249	3	748	5507	145	798	1546
Naparoo	Wheat	3356	2323	5679	2943	10	294	3	883	5373	145	779	1662
RGT_Accroc	Wheat	3002	2383	5385	2708	10	271	3	813	6000	145	870	1683
SF_Adagio	Wheat	2579	2281	4861	2288	10	229	3	687	5086	145	737	1424
SF_Scenario	Wheat	3323	2373	5696	2957	10	296	3	887	5253	145	762	1649
Sunlamb	Wheat	2575	1897	4472	1978	10	198	3	593	5560	170	945	1538
Sunmax	Wheat	3627	1812	5440	2752	10	275	3	826	5220	204	1065	1890

Table 22. Economic comparison of dual-purpose oat grazing trial results at Purlewaugh in 2016.

Variety	Crop type	DM1 (kg/ha)	DM2 (kg/ha)	Total DM	DM minus Field losses and residual	Conversion rate (kg DM to kg LWT)	Total liveweight produced (kg LWT/ha)	Liveweight value (\$/kg)	Total LWT value (\$/ha)	Grain Yield (kg/ha)	Price (adjusted for del. Grade) (\$/tonne)	Grain value (\$/ha)	Gross return (\$/ha)
Aladdin	Oat	3043	1222	4265	1812	10	181	3	544	2531	130	329	873
Bass	Oat	–	–	–	–	–	–	–	–	–	–	–	–
Bimbil	Oat	3737	1730	5467	2773	10	277	3	832	3327	130	432	1264
Bond	Oat	3164	924	4088	1670	10	167	3	501	2574	130	335	836
Boss	Oat	3540	753	4293	1834	10	183	3	550	2372	130	308	859
EGA_Wedgetail	Wheat	4593	2229	6823	3858	10	386	3	1157	4716	204	962	2120
Empire	Oat	2562	681	3243	995	10	99	3	298	2391	130	311	609
Endeavour	Triticale	4123	1925	6048	3239	10	324	3	972	3688	150	553	1525
Eurabbie	Oat	4500	1534	6034	3227	10	323	3	968	2959	130	385	1353
Genie	Oat	3550	578	4128	1703	10	170	3	511	2008	130	261	772
Graza 85	Oat	–	–	–	–	–	–	–	–	–	–	–	–
Mammoth	Oat	3277	869	4146	1716	10	172	3	515	2185	130	284	799
Mannus	Oat	4277	1550	5828	3062	10	306	3	919	3631	130	472	1391
Nile	Oat	4106	1627	5733	2986	10	299	3	896	2689	130	350	1245
Savannah	Oat	3653	859	4513	2010	10	201	3	603	2216	130	288	891
SF_Colossus	Oat	4061	847	4909	2327	10	233	3	698	1617	130	210	908
SF_Tucana	Oat	3455	1270	4725	2180	10	218	3	654	2036	130	265	919
Yarran	Oat	3815	1449	5264	2611	10	261	3	783	3259	130	424	1207
Yiddah	Oat	3984	1822	5807	3045	10	305	3	914	3535	130	460	1373

Spicers Creek

Table 23. Economic comparison of dual-purpose wheat, triticale and barley grazing trial results at Spicers Creek in 2016.

Variety	Crop type	DM1 (kg/ha)	DM2 (kg/ha)	Total DM	DM minus field losses & residual	Conversion rate (kg DM to kg LWT)	Total liveweight produced (kg LWT/ha)	Liveweight value (\$/kg)	Total LWT value (\$/ha)	Grain yield (kg/ha)	Price (adjusted for del. grade) (\$/tonne)	Grain value (\$/ha)	Gross return (\$/ha)
Urambie	Barley	3218	2237	5455	2764	10	276	3	829	5153	140	721	1551
Cartwheel	Triticale	2634	2769	5403	2723	10	272	3	817	6106	150	916	1733
Crackerjack2	Triticale	2379	1735	4115	1692	10	169	3	508	2849	150	427	935
Endeavour	Triticale	2887	2523	5410	2728	10	273	3	818	5086	150	763	1581
Tobruk	Triticale	2587	2758	5346	2677	10	268	3	803	6638	150	996	1799
Tuckerbox	Triticale	3407	1334	4740	2192	10	219	3	658	4519	150	678	1336
DS_Pascal	Wheat	2183	1293	3476	1181	10	118	3	354	5334	177	944	1298
EGA_Gregory	Wheat	3162	1242	4404	1923	10	192	3	577	5406	204	1103	1680
EGA_Wedgetail	Wheat	2710	1745	4455	1964	10	196	3	589	5876	227	1334	1923
LRPB Kittyhawk	Wheat	2891	1896	4787	2230	10	223	3	669	5128	227	1164	1833
Mackellar	Wheat	1674	1660	3334	1067	10	107	3	320	5211	145	756	1076
Manning	Wheat	2513	1846	4359	1887	10	189	3	566	4878	145	707	1273
Naparoo	Wheat	2699	2148	4847	2277	10	228	3	683	5675	145	823	1506
RGT_Accroc	Wheat	2354	2344	4698	2158	10	216	3	647	5931	145	860	1507
SF_Adagio	Wheat	2172	1780	3952	1562	10	156	3	469	5846	145	848	1316
SF_Scenario	Wheat	1989	2047	4036	1629	10	163	3	489	4908	145	712	1200
Sunlamb	Wheat	2717	1586	4303	1842	10	184	3	553	4986	170	848	1400
Sunmax	Wheat	3382	1484	4866	2293	10	229	3	688	4817	227	1094	1781

Table 24. Economic comparison of dual-purpose oat grazing trial results at Spicers Creek in 2016.

Variety	Crop type	DM1 (kg/ha)	DM2 (kg/ha)	Total DM	DM minus field losses & residual	Conversion rate (kg DM to kg LWT)	Total liveweight produced (kg LWT/ha)	Liveweight value (\$/kg)	Total LWT value (\$/ha)	Grain yield (kg/ha)	Price (adjusted for del. grade) (\$/tonne)	Grain value (\$/ha)	Gross return (\$/ha)
Aladdin	Oat	2166	995	3160	928	10	93	3	278	2751	130	358	636
Bass	Oat	–	–	–	–	–	–	–	–	–	–	–	–
Bimbil	Oat	2703	1039	3741	1393	10	139	3	418	3297	130	429	847
Bond	Oat	2690	1483	4173	1738	10	174	3	521	3147	130	409	931
Boss	Oat	2596	708	3304	1043	10	104	3	313	3169	130	412	725
EGA_Wedgetail	Wheat	2995	1760	4755	2204	10	220	3	661	5002	204	1020	1681
Empire	Oat	2281	688	2969	775	10	78	3	233	2792	130	363	596
Endeavour	Triticale	2653	1683	4335	1868	10	187	3	561	3912	150	587	1147
Eurabbie	Oat	2532	1244	3776	1421	10	142	3	426	3105	130	404	830
Genie	Oat	2482	882	3364	1091	10	109	3	327	1859	130	242	569
Graza 85	Oat	–	–	–	–	–	–	–	–	–	–	–	–
Mammoth	Oat	2651	1196	3848	1478	10	148	3	443	2384	130	310	753
Mannus	Oat	2338	1453	3791	1433	10	143	3	430	4039	130	525	955
Nile	Oat	3630	1823	5453	2762	10	276	3	829	2968	130	386	1214
Savannah	Oat	2160	770	2930	744	10	74	3	223	2363	130	307	530
SF_Colossus	Oat	2431	1043	3474	1179	10	118	3	354	1796	130	233	587
SF_Tucana	Oat	3383	1266	4649	2119	10	212	3	636	1480	130	192	828
Yarran	Oat	2323	1116	3439	1151	10	115	3	345	3743	130	487	832
Yiddah	Oat	2945	974	3919	1535	10	154	3	461	3328	130	433	893

Trial management

Table 25. Dual-purpose wheat, barley and triticale grazing trial management.

Site	Bathurst	Cudal	Holbrook	Purlewaugh	Somerton	Spicers Creek	Wagga Wagga
Paddock history	2015 canola	2014 oats, 2015 wheat	2015 canola	2014 pasture, 2015 wheat	2015 canola	2014 lucerne pasture, 2015 canola	2015 lupins
Sowing date	5 Apr 2016	20 Apr 2016	2016	20 Apr 2016	6 May 2016	5 May 2016	2 May 2016
Target plant population (plants/m²)	180	180	180	180	180	180	180
Seed fungicide	400 mL/100 kg seed Hombre	400 mL/100 kg seed Hombre	400 mL/100 kg seed Hombre	400 mL/100 kg seed Hombre	400 mL/100 kg seed Hombre	400 mL/100 kg seed Hombre	400 mL/100 kg seed Hombre
Fertiliser – sowing	100 kg/ha MAP (treated with Intake)	100 kg/ha MAP (treated with Intake)	95 kg/ha MAP (treated with Intake)	95 kg/ha Granulock 12 + Zn (treated with Intake)	95 kg/ha Granulock 12 + Zn (treated with Intake)	95 kg/ha Granulock 12 + Zn (treated with Intake)	95 kg/ha MAP (treated with Intake)
	100 kg/ha urea	100 kg/ha urea	60 kg/ha urea	70 kg/ha urea	70 kg/ha urea	140 kg/ha urea 70 kg/ha Gran Am	60 kg/ha urea
– incrop	100 kg/ha urea (26 July)	100 kg/ha urea (24 June)	150 kg/ha urea (8 Aug)	150 kg/ha urea (25 Aug)	150 kg/ha urea (29 Aug)	150 kg/ha urea (30 Aug)	150 kg/ha urea (26 July)
	100 kg/ha urea (23 Aug)	100 kg/ha urea (17 Aug)	100 kg/ha urea (31 Aug)				100 kg/ha urea (24 Aug)
Herbicides – presowing	1.6 L/ha Trifluralin 480 + 1.6 L/ha Avadex Xtra	118 g/ha Sakura (8 Apr)	35 g/ha Logran + 800 mL/ha Trifluralin 480 + 2.0 L/ha Boxer Gold	30 g/ha Logran + 1.0 L/ha Trifluralin 480 + 2.0 L/ha Boxer Gold	30 g/ha Logran + 1.0 L/ha Trifluralin 480 + 2.0 L/ha Boxer Gold	30 g/ha Logran + 1.0 L/ha Trifluralin 480 + 2.0 L/ha Boxer Gold	35 g/ha Logran + 800 mL/ha Trifluralin 480 + 2.0 L/ha Boxer Gold
– sowing		1.6 L/ha Trifluralin 480 + 1.6 L Avadex Xtra					
– in crop	2 L/ha Precept	Mixed cereals 2 L/ha Precept + 300 mL/ha Axial	1.4 L/ha Precept 150 + 300 mL/ha Lontrel + 300 mL/ha Axial + 500 mL/ha Adigor	20 g/ha Tackle 750 + 750 mL/ha MCPA LVE 600 & 150 mL/ha Lontrel Advance	20 g/ha Tackle 750, 750 mL/ha MCPA LVE 600 & 150 mL/ha Lontrel Advance	20 g/ha Tackle 750 + 750 mL/ha MCPA LVE 600 & 150 mL/ha Lontrel Advance	1.4 L/ha Precept 150 + 300 mL/ha Lontrel + 300 mL/ha Axial + 500 mL/ha Adigor
Insecticides – at sowing	100 mL/ha Talstar	100 mL/ha Talstar	Nil at sowing	100 mL/ha Talstar	100 mL/ha Talstar	100 mL/ha Talstar	Nil at sowing
– in crop	250 g/ha Aphidex (13 Apr, 26 July and 13 Sept)	250 g/ha Aphidex (twice)	250 g/ha Pirimor	250 g/ha Aphidex (twice)	150 g/ha Aphidex	150 g/ha Aphidex	250 g/ha Pirimor (16 Sept and 11 Oct)
Fungicides	300 mL/ha Cogito (13 Sept and 25 Oct)	500 mL/ha Opus	300 mL/ha Prosaro	150 mL/ha Prosaro	150 mL/ha Prosaro	150 mL/ha Prosaro	300 mL/ha Prosaro (16 Sept and 11 Oct)
Dry matter cuts – DM1	22 June (grazed 23 June)	22 June (grazed 22 June)	18 July (grazed 20 July)	13 July (grazed 14 July)	19 July (grazed 20 July)	14 July (grazed 15 July)	12 and 13 July (grazed 13–16 July)
– DM2	23 Aug (not grazed)	16 Aug (not grazed)	18 Aug (not grazed)	18 Aug (not grazed)	17 Aug (not grazed)	19 Aug (grazed 20 Aug)	15 & 16 Aug (grazed 16–24 Aug)
Harvest date	22 Dec 2016	18 Dec 2016	20 Dec 2016	14 Dec 2016	13 Dec 2016	21 Dec 2016	15 Dec 2016

Table 26. Dual-purpose oat grazing trial management.

Site	Wheat, triticale and barley	Oats	Holbrook	Purlewaugh	Somerton	Spicers Creek	Wagga Wagga
Paddock history	2016 canola	2016 canola	2015 canola	2014 pasture, 2015 wheat	2015 canola	2014 lucerne pasture, 2015 canola	2015 lupins
Sowing date	5 Apr 2016	20 Apr 2016	4 May 2016	20 Apr 2016	6 May 2016	5 May 2016	2 May 2016
Target plant population (plants/m ²)	180	180	180	180	180	180	180
Seed fungicide	400 mL/100 kg seed Hombre	400 mL/100 kg seed Hombre	400 mL/100 kg seed Hombre	400 mL/100 kg seed Hombre	400 mL/100 kg seed Hombre	400 mL/100 kg seed Hombre	400 mL/100 kg seed Hombre
Fertiliser – sowing	100 kg/ha MAP (treated with Intake)	100 kg/ha MAP (treated with Intake)	95 kg/ha MAP (treated with Intake)	95 kg/ha Granulock 12 + Zn (treated with Intake)	95 kg/ha Granulock 12 + Zn (treated with Intake)	95 kg/ha Granulock 12 + Zn (treated with Intake)	95 kg/ha MAP (treated with Intake)
	100 kg/ha urea	100 kg/ha urea	60 kg/ha urea	70 kg/ha urea	70 kg/ha urea	140 kg/ha urea	60 kg/ha urea
						70 kg/ha Gran Am	
Fertiliser –incrop	100 kg/ha urea (26 July)	100 kg/ha urea (20 June)	150 kg/ha urea (8 Aug)	150 kg/ha urea (25 Aug)	150 kg/ha urea (30 Aug)	150 kg/ha urea (30 Aug)	150 kg/ha urea (26 July)
	100 kg/ha urea (23 Aug)	100 kg/ha urea (4 Aug)	100 kg/ha urea (31 Aug)				100 kg/ha urea (17 Aug)
Herbicides – post sowing	200 mL/ha Dual Gold + 20 g/ha Tackle 750	20 g/ha Tackle 750	250 mL/ha Dual Gold + 1.5 L/ha Diuron 500	250 mL/ha Dual Gold + 1.5 L/ha Diuron 500	250 mL/ha Dual Gold + 1.5 L/ha Diuron 500	250 mL/ha Dual Gold + 1.5 L/ha Diuron 500	250 mL/ha Dual Gold + 1.5 L/ha Diuron 500
– in crop	2 L/ha Precept	2 L/ha Precept	25 g/ha Glean (31 May)	20 g/ha Tackle 750 + 750 mL/ha MCPA LVE 600 + 150 mL/ha Lontrel Advance	20 g/ha Tackle 750 + 750 mL/ha MCPA LVE 600 + 150 mL/ha Lontrel Advance	20 g/ha Tackle 750 + 750 mL/ha MCPA LVE 600 + 150 mL/ha Lontrel Advance	25 g/ha Glean (31 May)
			1.4 L/ha Precept, 150 + 300 mL/ha Lontrel (20 Sept)				1.4 L/ha Precept 150 + 300 mL/ha Lontrel (13 Sept)
Insecticides – at sowing	100 mL/ha Talstar	100 mL/ha Talstar)	Nil at sowing	100 mL/ha Talstar	100 mL/ha Talstar	100 mL/ha Talstar	Nil at sowing
	250 g/ha Aphidex (13 April, 26 July and 13 Sept)	250 g/ha Aphidex (twice)	250 g/ha Pirimor	250 g/ha Aphidex (twice)	150 g/ha Aphidex	150 g/ha Aphidex	250 g/ha Pirimor (26 Sept and 11 Oct)
Fungicides	300 mL/ha Cogito (13 Sept and 25 Oct)	300 mL/ha Cogito	300 mL/ha Prosaro	150 mL/ha Prosaro	150 mL/ha Prosaro	150 mL/ha Prosaro	300 mL/ha Prosaro (26 Sept and 11 Oct)
Dry matter cuts – DM1	14 June (grazed 16 June)	16 June (grazed 16 June)	4 July (grazed 17 July)	12 July (grazed 14 July)	11 July (grazed 12 July)	14 July (grazed 15 July)	6 and 7 July (grazed 9 July)
– DM2	23 Aug (grazed 24 Aug)	1 Aug (grazed 1 Aug)	23 Aug (grazed 28 Aug)	18 Aug (grazed 19 Aug)	17 Aug (grazed 18 Aug)	19 Aug (grazed 19 Aug)	8 and 9 Aug (grazed 12–15 Aug)
Harvest date	22 Dec 2016	13 Dec 2016	Not harvested	14 Dec 2016	13 Dec 2016	21 Dec 2016	19 Dec 2016

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