



DAIRY BEEF PROGENY TEST
INTERIM REPORT
April 2020



Acknowledgements

The Dairy Beef Progeny Test is a partnership across two properties, which includes the C. Alma Baker Trust NZ's Limestone Downs at Port Waikato and Pamu's Wairakei Pastoral Estate in Taupo.

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Participating herds: Thank you to the numerous bull owners and contributors that have supported the progeny test. For a list of sires in each cohort, including copies of earlier reports, please visit our website: www.blnzgenetics.com/progeny-tests

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Table of contents

Progeny test background	4
Birth Weight and Calving Ease	5
Gestation Length	5
Weaning age.....	5
Latest results: measurements for 2019-born calves (Cohort 4)	6
Table 1. Average birth weight, gestation length and weaning age of sires used in cohort 4	6
Sires that performed well for calving traits.....	7
Table 2. Sires used in cohorts 1-4 who have calves less than 36kg	7
Table 3. Sires used in cohorts 1-4 who have Gestation Length shorter than 280 days	8
Table 4. Top 20 sires in cohorts 1-4 who reached weaning weight fastest	9
Growth.....	10
Table 5. Average for live weight (kg) at 200-days, 400-days and 600-days of sires used in cohort 3	10
Table 6. Averages for live weight (kg) at 200-days of sires used in cohort 4	11
Table 7. Cohorts 1-3: Top 20 sires for 600-day weight	12
Table 8. Average birth weight (BWT), gestation length (GL), weaning age, 200, 400 and 600-day weight of the 15 “all-rounder” bulls	13
Carcass Traits.....	14
Table 9. Cohorts 1-2: Average Weight and Carcass traits	15
Table 10. Carcass traits measured on beef-cross-dairy progeny.	18

Understanding the report

This report provides an indication of how the sires are performing within B+LNZ Genetics' Dairy Beef Progeny Test (DBPT), and can't be directly compared against BREEDPLAN EBVs. For selection purposes it is strongly advised that BREEDPLAN EBVs and selection indexes be used primarily. They are the highest accuracy information to use in selection as they take into account all available industry data.

Progeny test background

The Dairy Beef Progeny Test began mating in 2015, and has since moved from Limestone Downs to Pāmu's Wairakei Pastoral Estate. The following cohorts are included in the progeny test:

Cohort 1	Born 2016	Limestone Downs
Cohort 2	Born 2017	Limestone Downs
Cohort 3	Born 2018	Wairakei Pastoral (born at Renown, finished at Orakonui)
Cohort 4	Born 2019	Wairakei Pastoral
Cohort 5	Due 2020	Wairakei Pastoral

Phase 1: Limestone Downs	Phase 2: Wairakei Pastoral
800 Friesian and KiwiCross cows + 220 heifers mated in 2015. 800 cows and 150 heifers mated in 2016. • Mated to Angus and Hereford sires by AI • Heifers naturally mated to 6 Angus and 6 Hereford sires (compared with 8 breed-average live weight and gestation length Jersey bulls) • Bred and finished at Limestone Downs, Port Waikato. Objectives 1. Demonstrate the successful use of beef bulls in a dairy system and dairy-beef finishing system 2. Assess the value added by selection of high merit, recorded bulls 3. Assess the value added by use of easy-calving bulls compared with Jersey bulls in a dairy system 4. Identify through a progeny test, appropriate bulls for dairy-beef system	1600 crossbred cows milked once-daily, mated at Wairakei's Renown farm in 2017, 2018 and 2019. • Cows are typical of those to be mated to beef bulls in the dairy industry. • Mated to 26 nominated beef sires each year and open to all breeds. • Calves are reared at Renown (or commercial calf rearer), then transferred to Orakonui, within the Wairakei Pastoral Group for growing out. Objectives 1. Identify and prove bulls that have short gestation length, easy calving, excellent growth rates to 600 days of age and high intramuscular fat that would be suitable for widespread use in the dairy industry via AI. 2. Provide a central herd in which bulls from multiple breeds can be progeny tested and benchmarked 3. Allow comparison of finishing performance of dairy-beef versus traditional beef calves, through links with the B+LNZ Genetics Beef Progeny Test

Key insights from the report

- There is a huge pool of bulls available that can be used safely over dairy cows and offer an improvement in gestation length and calf value.
- High quality beef can be produced from dairy beef calves, improving industry sustainability.
- Consideration of finishing traits, as well as calving traits, when selecting bulls can greatly increase the value of the calf to the rearer and finisher, without impairing calving performance.
- Sire has a big impact on growth and carcass traits of dairy-beef calves. i.e. Not all white-face or Angus calves are equal.
- Calves that are heavy at 4 days of age are not necessarily heavy at finishing. Knowing the sires' EBVs will help judge potential.

Birth Weight and Calving Ease

Average birthweights for all cohorts have been in the 36-38 kg range, from Friesian-Jersey crossbred cows. This means they are comparably sized to calves from Friesian bulls used in similar crossbred herds. No bull used in the progeny test to date has caused significant calving problems when used over mixed-aged cows. In all cohorts, total calving assistance has been less than 1% and farmers report it is similar to the amount of assistance they would normally expect. At the 2019 calving, 6 normally-presented and one breech calf were assisted. The vet assisted the breech calf and one normally-presented calf. Each assisted calf was from a different sire.

It is clear that there is significant scope to use beef bulls over dairy cows without causing calving problems. Herd testing at Limestone Downs revealed no impact of calf birth weight or sire of calf on the subsequent in-calf rate or milk production of the cows. The bulls used in this project provide a reference point for suitable birthweight EBVs within breed.

Gestation Length

The average gestation length of the bulls in 2019 was 282 days, in line with the dairy breed norm. The bull with the shortest Gestation Length shaved 6 days off the dairy average, coming in at 276 days, while several bulls had gestation lengths up to a week longer than the dairy norm.

Bull selection has a big impact on Gestation Length, and a shorter gestation length means earlier calving and more days in milk for the dairy cow. In addition, where beef bulls are used in the last weeks of the mating period, a shorter gestation is particularly desirable to bring the cow earlier calving in the following year and increase her chances of staying in the herd subsequently.

Selection among the sires used in cohort 4 could change the calving date by up to 13 days.

Weaning age

Calves were weaned based on live weight (not age), at an average of 95 kg. Therefore, age at weaning is calculated as a measure of pre-weaning growth. A lower value means progeny from that sire reached weaning weight faster than progeny from sires with a higher value. This is not adjusted for birth weight, so lighter birthweight sires have more live weight to gain before weaning and typically take longer to reach weaning weight.

Latest results: measurements for 2019-born calves (Cohort 4)

Table 1. Average birth weight, gestation length and weaning age of sires used in Cohort 4

Sire	Breed	n	Birth weight (kg)	Gestation length (days)	Age at weaning (days)
Focus 171293	Angus	23	37.6 (24)	280.6 (10)	85.0 (7)
Linton 16-107	Angus	19	33.6 (3)	282.6 (17)	85.8 (9)
Rissington 160043	Angus	31	32.8 (2)	276.0 (1)	91.5 (25)
Storth Oaks M33	Angus	32	35.4 (10)	279.9 (7)	83.3 (3)
Storth Oaks M64	Angus	27	32.3 (1)	278.1 (2)	90.5 (23)
Te Mania 15380	Angus	41	36.3 (17)	281.3 (15)	86.9 (12)
Te Mania Matrix 16018	Angus	34	35.9 (14)	281.1 (14)	88.7 (16)
Waitangi M203	Angus	29	35.6 (12)	279.3 (5)	86.4 (10)
Kakahu Gerry 140506	Charolais	39	38.7 (26)	282.3 (16)	80.1 (1)
Vollgas PS	Fleckveih	34	36.9 (20)	288.8 (26)	87.5 (14)
Ardo Ajax 5014	Hereford	53	33.7 (4)	281 (12)	88.7 (17)
Ardo Vostock 5341	Hereford	26	34.9 (9)	280.8 (11)	84.3 (6)
Matariki 110637	Hereford	9	37.1 (22)	283.6 (23)	86.9 (11)
Mangatara 335L	Limousin	37	35.7 (13)	280.3 (8)	87.3 (13)
Mangatara Jool	Limousin	34	37.3 (23)	288.7 (25)	88.9 (18)
Torrisdale Kakanui K123	Murray Grey	49	36.5 (18)	280.3 (9)	90.2 (22)
Jipidji	Normande	29	36.8 (19)	278.7 (4)	88.6 (15)
Glendhu Lochore 16603	Shorthorn	31	35.6 (11)	282.9 (19)	91.7 (26)
Kerrah Efficient E500	Simmental	35	34.9 (8)	283.5 (22)	90.9 (24)
Leafland E121	Simmental	14	38.7 (25)	283.4 (20)	81.0 (2)
Rissington AF184	Simmental	29	36.9 (21)	283.5 (21)	83.6 (5)
Aschwood Black Sambo 501	South Devon	38	36.0 (15)	279.3 (6)	89.1 (19)
Parkvale Kiwi K01	Speckle Park	37	36.2 (16)	284.4 (24)	89.7 (20)
Focus Trinity 135263	Stabilizer	27	34.6 (7)	281.1 (13)	89.7 (21)
Stabilizer 165303	Stabilizer	49	33.7 (5)	278.4 (3)	85.2 (8)
Stabilizer 16538	Stabilizer	22	34.2 (6)	282.8 (18)	83.5 (4)

* Indicates a sire used in over more than one year.

NB. One sire produced only 5 calves and has been excluded from the analysis.

Sires that performed well for calving traits

Table 2. Sires used in cohorts 1-4 who have calves less than 36kg

Based on a minimum of 10 progeny. To date, no sires used in the progeny test have caused calving problems.

Sire	Breed	n	Birth weight (kg)	Gestation length (days)	Age at weaning (days)
Storth Oaks M64	Angus	28	32.3	278.1	90.5
Rissington 160043	Angus	31	32.8	276.0	91.5
Rissington C200	Angus	35	32.8	278.4	84.8
Te Whanga 16-039	Angus	26	33.5	278.2	97.2
Linton 16-107	Angus	20	33.6	282.6	85.8
Ardo Ajax 5014	Hereford	53	33.7	281.0	88.7
Stabilizer 165303	Stabilizer	50	33.7	278.4	85.2
Storth Oaks L26	Angus	38	33.9	278.6	92.0
Stabilizer 16538	Stabilizer	24	34.2	282.8	83.5
Seven Hills 85/15	Angus	32	34.5	280.3	94.9
Focus Trinity 135263	Stabilizer	27	34.6	281.1	89.7
Ardo Vostock 5341	Hereford	26	34.9	280.8	84.3
Kerrah Efficient E500	Simmental	35	34.9	283.5	90.9
Storth Oaks K122	Angus	34	35.0	278.9	87.4
Stabilizer 165287	Stabilizer	31	35.3	281.6	91.7
Storth Oaks M33	Angus	32	35.4	279.9	83.3
Storth Oaks Angus Prime K5	Angus	24	35.5	278.4	92.0
Linton 13041	Angus	21	35.6	281.5	91.1
Waitangi Focus D213	Angus	16	35.6	282.8	94.4
Waitangi M203	Angus	30	35.6	279.3	86.4
Glendhu Lochore 16603	Shorthorn	31	35.6	282.9	91.7
Mangatara 335L	Limousin	38	35.7	280.3	87.3
Craigmore Ike 140260	Hereford	27	35.8	284.2	93.8
Focus Progression 110178	Angus	12	35.9	280.8	92.4
Te Mania Matrix 16018	Angus	34	35.9	281.1	88.7
Ardo Bismarck 4256	Hereford	37	35.9	281.0	92.6

Table 3. Sires used in cohorts 1-4 who have Gestation Length shorter than 280 days (based on a minimum of 10 progeny)

Sire	Breed	n	Birth weight (kg)	Gestation length (days)	Age at weaning (days)
Rissington 160043	Angus	31	32.8	276.0	91.5
Bluestone 140027	Hereford	11	38.2	276.6	90.4
Seven Hills 173-06	Angus	13	37.2	276.7	93.3
Matauri Reality 839	Angus	15	37.7	277.7	85.7
Hiwiroa Patriach 14044	Shorthorn	27	36.6	277.9	86.3
Storth Oaks M64	Angus	28	32.3	278.1	90.5
Te Whanga 16-039	Angus	26	33.5	278.2	97.2
Storth Oaks Everest J20	Angus	22	37.4	278.3	90.8
Bluestone 140015	Hereford	21	40.8	278.3	88.4
Storth Oaks Angus Prime K5	Angus	24	35.5	278.4	92.0
Rissington C200	Angus	35	32.8	278.4	84.8
Flagstaff Dynamo G6	Hereford	20	37.5	278.4	88.1
Stabilizer 165303	Stabilizer	50	33.7	278.4	85.2
Storth Oaks L26	Angus	38	33.9	278.6	92.0
Focus 110002	Angus	12	37.3	278.6	82.2
Grampians Lottery K13	Angus	21	39.8	278.7	90.9
Jipidji	Normande	31	36.8	278.7	88.6
Storth Oaks K122	Angus	34	35.0	278.9	87.4
Pinebank 1/06	Angus	18	37.3	279.0	92.0
Glenside Crumpy C4	Simmental	36	36.4	279.1	82.3
Storth Oaks K134	Angus	13	42.2	279.3	82.9
Waitangi M203	Angus	30	35.6	279.3	86.4
Thomas Up River 1614	Angus	12	37.2	279.3	88.2
Aschwood Black Sambo 501	South Devon	38	36.0	279.3	89.1
Totaranui 13007	Angus	16	38.2	279.4	84.2
Blue Mountain Brillianz 05	Angus	21	40.1	279.5	83.8
Earnsclaugh Bartel 144307	Angus	32	37.7	279.7	88.7
Bluestone 160022	Hereford	28	36.3	279.7	91.2
Matauri Resolution F030	Angus	16	38.9	279.8	88.4
Storth Oaks M33	Angus	32	35.4	279.9	83.3

Table 4. Top 20 sires in Cohort 1-4 who reached weaning weight fastest (based on a minimum of 10 progeny)

Sire	Breed	n	Birth weight (kg)	Gestation length (days)	Age at weaning (days)
Kakahu Gerry 140506	Charolais	39	38.7	282.3	80.1
Koanui Bedford 4081	Hereford	13	40.6	282.7	80.4
Limehills Awesome X117	Hereford	16	45.2	287.2	80.5
Leafland E121	Simmental	14	38.7	283.4	81.0
Limehills Stamper 20719	Hereford	18	41.6	285.4	81.2
Kairaumati Coal Face 1482	Hereford	12	39.9	284.5	81.4
Shalom Waigroup 319/07	Angus	12	37.3	281.2	81.8
Focus 110002	Angus	12	37.3	278.6	82.2
Beechwood Turk	Hereford	19	38.1	281.4	82.3
Glenside Crumpy	Simmental	36	36.4	279.1	82.3
Koanui Unanimous 0408	Hereford	17	39.8	283.9	82.7
Westholm Koala K13	Hereford	16	37.7	282.7	82.7
Storth Oaks K134	Angus	13	42.2	279.3	82.9
Storth Oaks M33	Angus	32	35.4	279.9	83.3
Stabilizer 16S38	Stabilizer	24	34.2	282.8	83.5
Otapawa Spark 3060	Hereford	24	39.8	281.1	83.6
Rissington AF184	Simmental	29	36.9	283.5	83.6
Blue Mountain Brillianz 05	Angus	21	40.1	279.5	83.8
Koanui Briton 2044	Hereford	39	36.9	284.4	83.8
Wirruna Echucac 99	Hereford	16	38.5	283.5	83.9

Growth

Cohort 4 calves have reached 200 days of age, and Cohort 3 calves have reached 600 days of age. Previous work demonstrated that live weight at 200d has a poor relationship with sire EBV. The nature of the rearing system is to feed lighter calves longer when working to a fixed weaning weight, therefore favouring calves from slower-growing sires. Later weights are more reflective of sire growth potential.

Table 5. Average for live weight (kg) at 200-days, 400-days and 600-days of sires used in cohort 3

(that had at least 10 progeny present at 200 days of age) Note: all progeny from a sire contribute to the mean, regardless of the cohort of birth.

Name	Breed	n 200	LW200	LW400	LW600
Earnsclough Tussock 144307	Angus	29	182.3 (5)	301.1 (11)	442.1 (7)
Rissington C200	Angus	35	177.7 (11)	301.9 (9)	433.1 (12)
Seven Hills 85/15	Angus	29	166.1 (22)	287.3 (20)	413.6 (23)
Storth Oaks Angus Prime K5	Angus	22	162.7 (25)	277.0 (25)	405.8 (25)
Storth Oaks K122	Angus	33	171.1 (18)	293.2 (16)	431.9 (14)
Storth Oaks L26	Angus	35	174.0 (15)	282.6 (23)	417.4 (21)
Te Mania 15380	Angus	40	171.0 (19)	299.2 (14)	436.8 (11)
Te Mania 16305	Angus	6	176.4 (13)	305.9 (5)	447.4 (4)
Te Whanga 16-039	Angus	22	162.9 (24)	285.8 (22)	416.1 (22)
Kakahu Gerry 140506	Charolais	33	187.5 (1)	327.3 (1)	470.2 (1)
Ardo Ajax 5014	Hereford	49	177.2 (12)	300.7 (12)	429.9 (15)
Ardo Bismarck 4256	Hereford	36	164.3 (23)	275.3 (26)	403.4 (26)
Bluestone 160022	Hereford	23	178.3 (8)	286.9 (21)	418.6 (19)
Craigmore Ike 140260	Hereford	25	161.3 (26)	279.6 (24)	410.9 (24)
Koanui Briton 2044	Hereford	36	178.2 (9)	303.8 (8)	442.3 (6)
Koanui Rocket 0219	Hereford	43	180.0 (7)	304.3 (7)	440.6 (8)
LimeHills Streaker150368	Hereford	25	180.1 (6)	304.8 (6)	440.0 (9)
Monymusk Henry 120012	Hereford	18	171.9 (16)	300.6 (13)	437.5 (10)
Shrimptons Hill 130168	Hereford	30	170.2 (20)	291.3 (18)	420.3 (17)
Piwakawa Kagan	Limousin	21	169.7 (21)	293.6 (15)	422.9 (16)
Torrisdale Kakanui K123	Murray Grey	45	171.2 (17)	291.5 (17)	419.0 (18)
Hiwiroa Patriach 14044	Shorthorn	23	175.8 (14)	291.2 (19)	417.8 (20)
Glenside Crumpy C4	Simmental	35	186.3 (2)	308.5 (4)	450.2 (3)
Janefield Ed AE1	Simmental	21	185.0 (3)	313.2 (3)	444.8 (5)
Stabilizer 165287	Stabilizer	30	183.7 (4)	316.9 (2)	452.4 (2)

Table 6. Averages for live weight (kg) at 200-days of sires used in cohort 4

(note that all progeny from a sire contribute to the mean, regardless of the cohort of birth).

Name	Breed	n 200d	LW200
Focus 171293	Angus	21	176.0 (11)
Linton 16-107	Angus	19	173.2 (14)
Rissington 160043	Angus	30	171.6 (18)
Storth Oaks M33	Angus	30	180.9 (2)
Storth Oaks M64	Angus	25	177.2 (9)
Te Mania 15380	Angus	40	171.0 (21)
Te Mania Matrix 16018	Angus	31	176.0 (11)
Waitangi M203	Angus	28	173.6 (13)
Kakahu Gerry 140506	Charolais	33	187.5 (1)
Vollgas PS	Fleckveih	31	160.0 (26)
Ardo Ajax 5014	Hereford	49	177.2 (9)
Ardo Vostock 5341	Hereford	24	178.1 (6)
Matariki 110637	Hereford	10	172.3 (15)
Mangatara 335L	Limousin	35	166.6 (24)
Mangatara Jool	Limousin	30	160.3 (25)
Torrisdale Kakanui K123	Murray Grey	45	171.2 (20)
Jipidji	Normande	28	172.3 (15)
Glendhu Lochore 16603	Shorthorn	28	167.0 (23)
Kerrah Efficient E500	Simmental	30	171.3 (19)
Leafland E121	Simmental	13	178.5 (4)
Rissington AF184	Simmental	26	178.1 (6)
Aschwood Black Sambo 501	South Devon	36	172.2 (17)
Parkvale Kiwi K01	Speckle Park	32	170.2 (22)
Focus Trinity 135263	Stabilizer	24	178.2 (5)
Stabilizer 165303	Stabilizer	46	178.1 (6)
Stabilizer 16S38	Stabilizer	19	180.6 (3)

Sire rankings were highly correlated among live weight at 200, 400 and 600 days of age. The top growth sires for 600-day weight (from all cohorts), are featured in the blue column, in the table below.

Table 7. Cohorts 1-3: Top 20 sires for 600-day weight

Name	Breed	n born	BWT (kg)	GL (d)	Age of weaning (d)	n 200d	LW200 (kg)	LW400 (kg)	LW600 (kg)
Thomas Up River 1614	Angus	12	37.2	279.3	88.2	12	172.8	294.9	438.7
Riverton Baltic 09 183	Hereford	16	39.0	284.6	91.4	13	176.7	297.6	438.8
Wiruna Echuca 99	Hereford	16	38.5	283.5	83.9	13	175.4	301.7	439.9
LimeHills Streaker150368	Hereford	26	37.5	284.0	85.3	25	180.1	304.8	440.0
Koanui Rocket 0219	Hereford	44	37.7	283.6	85.6	43	180.0	304.3	440.6
Earnsclough Tussock 144307	Angus	32	37.7	279.7	88.7	29	182.3	301.1	442.1
Koanui Briton 2044	Hereford	39	36.9	284.4	83.8	36	178.2	303.8	442.3
Beechwood Doubtless	Hereford	14	38.6	280.9	87.7	12	173.9	297.3	443.3
Janefield Ed AE1	Simmental	23	38.9	283.7	88.0	21	185.0	313.2	444.8
Storth Oaks H41	Angus	15	40.3	280.0	84.4	11	178.8	302.9	445.0
Shalom Waigroup 319/07	Angus	12	37.3	281.2	81.8	11	181.1	303.6	445.2
Flagstaff Big Red E8	Hereford	12	40.9	283.8	86.3	10	175.3	302.2	447.3
Koanui Unanimous 0408	Hereford	17	39.8	283.9	82.7	15	179.8	308.8	448.0
Focus 110002	Angus	12	37.3	278.6	82.2	12	179.9	307.1	449.3
Glenside Crumpy C4	Simmental	36	36.4	279.1	82.3	35	186.3	308.5	450.2
Koanui Bedford 4081	Hereford	13	40.6	282.7	80.4	11	180.1	304.5	451.0
Stabilizer 165287	Stabilizer	31	35.3	281.6	91.7	30	183.7	316.9	452.4
LimeHills Awesome X117	Hereford	16	45.2	287.2	80.5	13	185.9	308.9	453.3
Storth Oaks K134	Angus	13	42.2	279.3	82.9	11	179.4	308.8	464.3
Kakahu Gerry 140506	Charolais	39	38.7	282.3	80.1	33	187.5	327.3	470.2

When selecting on 600-day weight alone, several of the sires identified have relatively high birth weight and/or long gestation length. Therefore, an alternative approach to identifying all-round high performers is to select sires that had birth weight below 40 kg, gestation length less than 282 days, and were better than average for weaning age (i.e. lower rearing cost), and were heavier above average for live weight at 600 days of age. Cohort 4 bulls were included if their progeny were heavier than average at 200-days of age (in place of the 600d weight criterion) because their progeny are not yet old enough to record 600d weight.

There were 15 bulls that met this “all-rounder” criteria, shown in the table below. These bulls had birth weight less than 40kg, gestation length shorter than 282 days, and were better than average for age at weaning and 600-day weight (or 200-day weight for cohort 4 bulls).

Table 8. Average birth weight (BWT), gestation length (GL), weaning age, 200, 400 and 600-day weight of the 15 “all-rounder” bulls

Highlighted values represent averages in the top 20% of all bulls tested to date.

Name	Breed	n born	BWT (kg)	GL (d)	Weaning age (d)	n 200d	LW200 (kg)	LW400 (kg)	LW600 (kg)
Focus 110002	Angus	12	37.3	278.6	82.2	12	179.9	307.1	449.3
Focus 171293	Angus	23	37.6	280.6	85.0	21	176.0		
Rennylea Edmund E11	Angus	18	39.2	280.0	87.0	17	174.0	293.9	431.0
Rissington C200	Angus	35	32.8	278.4	84.8	35	177.7	301.9	433.1
Shalom Waigroup 319/07	Angus	12	37.3	281.2	81.8	11	181.1	303.6	445.2
Storth Oaks K122	Angus	34	35.0	278.9	87.4	33	171.1	293.2	431.9
Storth Oaks M33	Angus	32	35.4	279.9	83.3	30	180.9		
Te Mania 15380	Angus	41	36.3	281.3	86.9	40	171.0	299.2	436.8
Totaranui 13007	Angus	16	38.2	279.4	84.2	15	173.0	292.6	431.4
Ardo Vostock 5341	Hereford	26	34.9	280.8	84.3	24	178.1		
Beechwood Turk	Hereford	19	38.1	281.4	82.3	19	173.3	294.3	433.1
Monymusk Henry 120012	Hereford	22	38.1	280.6	84.6	18	171.9	300.6	437.5
Otapawa Spark 3060	Hereford	24	39.8	281.1	83.6	23	172.6	294.2	437.7
Glenside Crumpy C4	Simmental	36	36.4	279.1	82.3	35	186.3	308.5	450.2
Stabilizer 165303	Stabilizer	49	33.7	278.4	85.2	46	178.1	301.5	432.6
Mean of all bulls tested			37.6	281.6	87.7		173.8	293.7	430.4

Carcass Traits

Cohorts 1&2, born at Limestone Downs

All calves born at Limestone Downs have been processed. At 3-4 months old – weighing a minimum of 100kg – they moved from the Limestone Downs' dairy unit to its sheep and beef hill-country farm. At 4 months old, calves were allocated to their lifetime mobs – based on weight and sex – where they remained until processing. Each year, there were 3 mobs of heifers and 3 mobs of steers. Calves were allocated to each mob so that the heaviest, middle and lightest third of each sire's calves were split across the three mobs for that sex.

The target slaughter weight was 500kg for heifers and 600kg for steers. The mob was deemed to be ready for processing when the mob average reached this target. A Greenlea Premier Meats livestock buyer inspected the cattle to confirm they were in suitable condition for processing, and each mob was processed in a single event.

All cattle went through two winters, with the heaviest mob of heifers processed in late July/early August (23 months) and the lightest mob of steers processed in February (31 months).

An impressive 97% of cattle graded P2, and the remainder were L2. Carcass weight and dressing-out percentage were affected by sire, as was eye muscle area. Therefore, for carcasses of the same weight, the proportion of weight in the high value muscles varied among sires. See photos alongside.

Cattle were weighed on-farm at Limestone Downs in the morning prior to trucking. They were transported to Greenlea's Hamilton plant for same-day slaughter. Carcass length, eye muscle area, fat depth, marbling score, and meat and fat colour were assessed in the chiller the morning following slaughter.

From cohort 1, meat samples were taken from randomly-selected progeny within each mob, from randomly-selected sires with sufficient progeny in cohort 1. The samples were aged for 21 days, then taken to the Massey University Meat Laboratory where they were analysed for pH, shear force (tenderness), and meat and fat colour.

In cohort 2, meat samples were not taken, but pH was measured in the chiller alongside the other chiller-assessments.

Carcass Weight	255 kg	237 kg	270 kg
EMA	98 cm ²	74 cm ²	62 cm ²
Fat depth	3 mm	8 mm	6 mm
Marble	0	3	1
Meat Colour	3	3	5
Fat Colour	3	4	4
pH	5.8	5.7	6.2
Shear force (tenderness)	3.68	4.49	9.72
	• Big steak • Lean • \$1390	• Good fat levels • Small carcass • \$1292	• Big carcass • Small steak • Meat quality issues • \$1472
			
			

Table 9. Cohorts 1-2: Average Weight and Carcass traits

Live weight, carcass weight, dressing-out percentage, carcass length, eye muscle area and fat depth of sires, with at least 5 progeny present at processing. Values below are averages, with sire ranking (out of 73 total) shown in brackets. This table includes sires used only over first-calving heifers, which are compared on carcass traits, but were not compared with other bulls on calving traits due to the impact of the younger dams on those traits. Carcass length, eye muscle area and fat depth are all adjusted to a common carcass weight.

Sire	Breed	n	Live weight on farm (kg)	Carcass weight (kg)	Dressing-out (%)	Carcass length (cm)	Eye muscle area (cm ²)	Fat depth (mm)
Blue Mountain Brillanz O5	Angus	14	550.7 (60)	270.6 (54)	49.2 (19)	239.5 (49)	76.4 (15)	5.0 (68)
Earnsclough Tussock 144307	Angus	12	575.8 (25)	278.0 (33)	48.4 (58)	240.3 (34)	74.8 (29)	8.2 (19)
Focus 110002	Angus	12	589.7 (11)	287.0 (12)	48.6 (51)	239.6 (47)	72.1 (49)	7.4 (33)
Focus Progression 110178	Angus	9	545.0 (68)	263.9 (70)	48.4 (58)	238.6 (57)	78.1 (7)	7.9 (25)
Glanworth Waigroup 1213	Angus	18	553.1 (54)	268.0 (62)	48.5 (56)	239.7 (45)	77.1 (12)	7.0 (43)
Grampians Lottery K13	Angus	15	534.5 (73)	257.8 (73)	48.2 (64)	238.0 (62)	69.6 (65)	6.7 (49)
Heather Dell L72	Angus	24	597.9 (4)	293.1 (5)	48.8 (38)	240.5 (32)	74.4 (33)	8.2 (19)
Kakahu 13059	Angus	10	562.2 (43)	273.8 (44)	48.7 (48)	242.6 (13)	76.1 (19)	4.8 (72)
Kakahu For Bond 13007	Angus	14	564.2 (41)	283.6 (23)	50.3 (1)	238.0 (62)	72.1 (49)	6.7 (49)
Linton 13041	Angus	18	559.4 (47)	271.5 (51)	48.6 (51)	241.7 (21)	75.1 (25)	6.2 (63)
Matauri Reality 839	Angus	11	558.3 (50)	275.7 (40)	49.4 (13)	237.3 (67)	72.6 (43)	7.0 (43)
Matauri Resolution F030	Angus	17	561.2 (45)	270.4 (55)	48.1 (68)	242.3 (17)	69.7 (64)	8.3 (18)
Pinebank 1/06	Angus	16	565.0 (40)	272.0 (50)	48.2 (64)	240.3 (34)	75.8 (21)	6.4 (58)
Puketi Regan 14123	Angus	9	579.0 (19)	288.3 (7)	50.0 (3)	236.5 (71)	80.9 (2)	7.9 (25)
Puketi Regan 14134	Angus	16	591.8 (8)	293.9 (4)	49.8 (6)	237.7 (65)	79.7 (3)	6.4 (58)
Rennylea Edmund E11	Angus	15	569.8 (32)	279.3 (30)	48.9 (32)	238.5 (58)	73.6 (38)	6.8 (48)
Seven Hills 161-06	Angus	9	572.7 (27)	285.1 (17)	49.8 (6)	240.3 (34)	77.3 (11)	8.2 (19)
Seven Hills 173-06	Angus	12	545.1 (67)	264.2 (69)	48.5 (56)	240.6 (31)	74.8 (29)	6.6 (53)
Shalom Waigroup 101/01	Angus	7	553.0 (55)	270.9 (53)	49.1 (21)	238.3 (60)	74.5 (32)	9.0 (9)
Shalom Waigroup 319/07	Angus	12	577.0 (23)	280.9 (28)	48.8 (38)	240.1 (41)	75.6 (23)	6.4 (58)
Storth Oaks Angus Prime K5	Angus	10	552.5 (56)	273.7 (45)	49.6 (9)	237.2 (68)	78.9 (5)	9.1 (7)
Storth Oaks Everest J20	Angus	20	577.4 (22)	281.7 (27)	48.8 (38)	240.3 (34)	72.2 (47)	8.7 (14)

Sire	Breed	n	Live weight on farm (kg)	Carcass weight (kg)	Dressing-out (%)	Carcass length (cm)	Eye muscle area (cm ²)	Fat depth (mm)
Storth Oaks H41	Angus	10	602.9 (2)	294.5 (3)	48.8 (38)	244.0 (4)	71.2 (56)	7.7 (29)
Storth Oaks J29	Angus	11	571.5 (28)	273.4 (48)	47.8 (71)	241.4 (24)	66.8 (72)	8.7 (14)
Storth Oaks K134	Angus	9	616.5 (1)	304.2 (1)	49.0 (26)	240.0 (44)	74.0 (36)	5.0 (68)
Storth Oaks K154	Angus	12	579.9 (18)	283.7 (22)	48.9 (32)	237.9 (64)	71.7 (52)	6.6 (53)
Te Atarangi Turi K026	Angus	29	548.8 (61)	271.1 (52)	49.5 (12)	236.5 (71)	75.1 (25)	8.0 (23)
Te Atarangi Wai L027	Angus	21	547.3 (64)	268.7 (59)	49.0 (26)	239.6 (47)	71.0 (58)	9.3 (5)
Te Mania Unlimited U3271	Angus	19	570.2 (31)	274.6 (42)	48.2 (64)	240.8 (27)	69.8 (62)	7.1 (39)
Thomas Up River 1614	Angus	13	565.6 (38)	272.3 (49)	48.2 (64)	239.4 (51)	67.2 (70)	7.7 (29)
Totaranui 13007	Angus	14	565.5 (39)	276.9 (36)	49.0 (26)	237.2 (68)	75.1 (25)	6.6 (53)
Turihau Liberation C27	Angus	18	557.9 (51)	277.2 (34)	49.4 (13)	238.3 (60)	76.2 (17)	6.4 (58)
Waitangi Focus D213	Angus	13	546.8 (65)	266.0 (68)	48.6 (51)	236.0 (73)	74.6 (31)	9.0 (9)
Woodbank Black Power	Angus	14	559.6 (46)	273.7 (45)	48.9 (32)	239.2 (53)	76.2 (17)	6.2 (63)
Ardo Achilles 120	Hereford	13	559.0 (48)	267.0 (65)	48.8 (38)	237.0 (70)	76.8 (14)	8.0 (23)
Ardo Bismarck 4256	Hereford	10	536.1 (72)	261.7 (71)	48.8 (38)	239.2 (53)	67.5 (69)	8.8 (13)
Ardo Extract 5298	Hereford	35	586.7 (13)	287.7 (9)	49.0 (26)	243.2 (6)	70.9 (59)	7.8 (28)
Ardo Ezicalve Caspian 6159	Hereford	13	544.4 (69)	260.8 (72)	47.9 (69)	243.0 (11)	68.0 (68)	7.6 (32)
Ardo Fargo 1154	Hereford	11	552.0 (58)	268.8 (58)	48.8 (38)	239.7 (45)	72.4 (44)	6.6 (53)
Beechwood Doubtless	Hereford	11	599.3 (3)	295.8 (2)	49.4 (13)	243.1 (8)	73.0 (41)	9.5 (4)
Beechwood Turk	Hereford	19	557.4 (52)	276.3 (39)	49.6 (9)	241.8 (20)	74.9 (28)	6.7 (49)
Bluestone 080014	Hereford	19	567.5 (36)	276.7 (38)	48.8 (38)	240.8 (27)	75.9 (20)	6.7 (49)
Bluestone 120061	Hereford	12	540.4 (70)	267.2 (63)	49.6 (9)	240.8 (27)	79.2 (4)	7.1 (39)
Bluestone 140015	Hereford	17	567.7 (34)	284.3 (20)	50.1 (2)	241.0 (26)	71.1 (57)	5.2 (67)
Bluestone 140027	Hereford	9	566.2 (37)	277.0 (35)	48.9 (32)	240.5 (32)	73.2 (40)	7.0 (43)
Burnfoot Playboy	Hereford	14	548.2 (62)	268.2 (61)	48.9 (32)	242.6 (13)	70.7 (60)	7.4 (33)
Colrairie Code Word 13 139	Hereford	15	578.7 (20)	276.9 (36)	47.7 (72)	242.5 (15)	74.2 (35)	7.2 (38)
Craigmore Baton 140337	Hereford	18	570.8 (30)	282.0 (26)	49.4 (13)	237.6 (66)	75.4 (24)	7.0 (43)

Sire	Breed	n	Live weight on farm (kg)	Carcass weight (kg)	Dressing-out (%)	Carcass length (cm)	Eye muscle area (cm ²)	Fat depth (mm)
Craigmore Opium 10214	Hereford	14	558.7 (49)	267.2 (63)	47.9 (69)	242.2 (19)	72.4 (44)	9.0 (9)
Craigmore Opium 150206	Hereford	5	583.4 (16)	286.2 (15)	49.1 (21)	244.1 (3)	65.4 (73)	4.4 (73)
Flagstaff Big Red E8	Hereford	11	587.1 (12)	287.7 (9)	49.0 (26)	243.1 (8)	71.4 (55)	8.5 (17)
Flagstaff Dynamo G6	Hereford	16	567.6 (35)	275.2 (41)	48.4 (58)	243.2 (6)	68.1 (67)	7.9 (25)
Haumoana Accent 14032	Hereford	26	571.1 (29)	284.7 (19)	49.9 (4)	238.4 (59)	76.3 (16)	7.3 (36)
Kairaumati Coal Face 1482	Hereford	11	545.9 (66)	268.6 (60)	48.7 (48)	239.2 (53)	78.0 (8)	9.8 (3)
Koanui Bedford 4081	Hereford	10	596.7 (5)	288.0 (8)	48.3 (61)	245.2 (1)	69.8 (62)	7.1 (39)
Koanui Briton 2044	Hereford	9	590.5 (10)	286.8 (13)	48.6 (51)	242.4 (16)	72.3 (46)	9.0 (9)
Koanui Rocket 0219	Hereford	25	586.6 (14)	287.3 (11)	49.0 (26)	240.3 (34)	71.8 (51)	8.6 (16)
Koanui Unanimous 0408	Hereford	14	592.7 (7)	286.6 (14)	48.3 (61)	241.3 (25)	75.8 (21)	6.9 (47)
Limehills Awesome X117	Hereford	13	594.6 (6)	290.7 (6)	48.8 (38)	241.5 (23)	82.9 (1)	5.3 (66)
Limehills Stamper 120719	Hereford	16	556.4 (53)	274.2 (43)	49.3 (18)	240.2 (39)	76.9 (13)	6.2 (63)
Mahuta Kimo 4029	Hereford	5	562.0 (44)	279.1 (31)	49.7 (8)	243.1 (8)	77.8 (9)	4.9 (70)
Maranui Hick 11-62	Hereford	6	582.2 (17)	283.4 (24)	48.7 (48)	240.2 (39)	73.9 (37)	11.3 (1)
Mataouri Koa 09 99	Hereford	10	552.2 (57)	266.9 (66)	48.3 (61)	243.0 (11)	70.1 (61)	8.2 (19)
Okawa Marshall 0109	Hereford	6	591.1 (9)	280.5 (29)	47.4 (73)	243.4 (5)	71.6 (53)	7.7 (29)
Orari Gorge Mischeif 120083	Hereford	10	547.9 (63)	269.5 (57)	49.1 (21)	244.8 (2)	71.5 (54)	4.9 (70)
Otapawa Spark 3060	Hereford	22	577.8 (21)	284.0 (21)	49.1 (21)	239.5 (49)	73.5 (39)	9.2 (6)
Otengi Wisco 23	Hereford	6	568.6 (33)	278.9 (32)	49.1 (21)	241.7 (21)	72.8 (42)	9.1 (7)
Platform Quebec	Hereford	13	551.5 (59)	269.7 (56)	48.9 (32)	242.3 (17)	67.2 (70)	10.3 (2)
Riverton Baltic 09 183	Hereford	15	574.9 (26)	283.2 (25)	49.2 (19)	240.1 (41)	77.5 (10)	6.6 (53)
Te Taumata Deluxe 12520	Hereford	11	584.6 (15)	285.3 (16)	48.8 (38)	239.2 (53)	72.2 (47)	6.3 (62)
Westholm Koala K13	Hereford	19	562.3 (42)	273.6 (47)	48.6 (51)	239.4 (51)	74.4 (33)	7.4 (33)
Wirruna Daffy D1	Hereford	14	540.0 (71)	266.8 (67)	49.9 (4)	240.7 (30)	78.9 (5)	7.3 (36)
Wirruna Echuca 99	Hereford	11	576.5 (24)	284.8 (18)	49.4 (13)	240.1 (41)	68.9 (66)	7.1 (39)

Table 10. Carcass traits measured on beef-cross-dairy progeny (34 Angus and 39 Hereford sires).

Rank shown in brackets. Sires without values for pH were sires used in cohort 1 only, that did not have meat samples collected.

Sire	Breed	n	Marble score	Fat colour Score	Meat colour Score	n pH	Ultimate pH
Blue Mountain Brillanz O5	Angus	14	3.1 (48)	2.6 (3)	0.6 (58)	7	5.71 (48)
Earnsclough Tussock 144307	Angus	12	3.1 (50)	2.9 (17)	1.3 (8)	12	5.67 (26)
Focus 110002	Angus	12	3.3 (70)	3.2 (57)	1.5 (2)	12	5.71 (48)
Focus Progression 110178	Angus	9	3.3 (71)	3.6 (72)	1.4 (6)	9	5.64 (10)
Glanworth Waigroup 1213	Angus	18	3 (42)	3.2 (60)	1.1 (18)	18	5.7 (44)
Grampians Lottery K13	Angus	15	3 (39)	2.9 (14)	0.7 (48)	15	5.66 (16)
Heather Dell L72	Angus	24	3.1 (54)	3.1 (44)	1.1 (18)	24	5.57 (1)
Kakahu 13059	Angus	10	3.3 (69)	3.0 (32)	1.3 (8)		
Kakahu For Bond 13007	Angus	14	3 (35)	3.1 (41)	0.7 (48)	11	5.69 (36)
Linton 13041	Angus	18	3 (41)	2.9 (17)	1.1 (18)	18	5.7 (44)
Matauri Reality 839	Angus	11	3.6 (73)	3.4 (69)	1.4 (6)	11	5.79 (65)
Matauri Resolution F030	Angus	17	2.9 (21)	3.1 (47)	0.7 (48)	16	5.76 (62)
Pinebank 1/06	Angus	16	3.2 (58)	3.3 (63)	1.0 (25)	16	5.65 (14)
Puketī Regan 14123	Angus	9	3.2 (66)	3.2 (56)	0.6 (58)		
Puketī Regan 14134	Angus	16	3.1 (48)	3.1 (47)	0.9 (33)		
Rennylea Edmund E11	Angus	15	2.9 (16)	3.3 (65)	1.3 (8)	13	5.66 (16)
Seven Hills 161-06	Angus	9	2.9 (22)	3.2 (54)	0.9 (33)	9	5.67 (26)
Seven Hills 173-06	Angus	12	2.9 (22)	2.9 (20)	0.6 (58)	4	5.69 (36)
Shalom Waigroup 101/01	Angus	7	3.2 (65)	2.7 (4)	0.7 (48)	7	5.62 (4)
Shalom Waigroup 319/07	Angus	12	2.8 (8)	2.7 (5)	0.9 (33)	6	5.66 (16)
Storth Oaks Angus Prime K5	Angus	10	3.1 (45)	2.9 (19)	1.5 (2)	10	5.69 (36)
Storth Oaks Everest J20	Angus	20	3.1 (44)	3.1 (40)	1.5 (2)	18	5.69 (36)
Storth Oaks H41	Angus	10	3 (34)	3.1 (53)	1.2 (15)	6	5.64 (10)
Storth Oaks J29	Angus	11	3.2 (66)	3.0 (32)	1.3 (8)	6	5.68 (34)

Sire	Breed	n	Marble score	Fat colour Score	Meat colour Score	n pH	Ultimate pH
Storth Oaks K134	Angus	9	3 (42)	3.1 (52)	0.7 (48)	9	5.69 (36)
Storth Oaks K154	Angus	12	3 (31)	3.0 (24)	1.1 (18)	12	5.66 (16)
Te Atarangi Turi K026	Angus	29	2.8 (12)	3.0 (28)	1.1 (18)	15	5.71 (48)
Te Atarangi Wai L027	Angus	21	3.1 (55)	3.1 (45)	0.7 (48)	21	5.64 (10)
Te Mania Unlimited U3271	Angus	19	2.9 (22)	2.9 (13)	1.5 (2)	19	5.66 (16)
Thomas Up River 1614	Angus	13	3.1 (50)	2.8 (10)	0.6 (58)	13	5.71 (48)
Totaranui 13007	Angus	14	3 (28)	2.9 (16)	1.1 (18)	14	5.68 (34)
Turihaua Liberation C27	Angus	18	2.9 (18)	3.1 (50)	1.0 (25)	14	5.66 (16)
Waitangi Focus D213	Angus	13	2.9 (22)	3.3 (61)	1.0 (25)	6	5.66 (16)
Woodbank Black Power	Angus	14	2.8 (11)	3.0 (37)	0.7 (48)	4	5.62 (4)
Ardo Achilles 120	Hereford	13	2.6 (1)	3.2 (54)	1.3 (8)	12	5.63 (7)
Ardo Bismarck 4256	Hereford	10	3.2 (62)	3.0 (28)	0.9 (33)	10	5.67 (26)
Ardo Extract 5298	Hereford	35	3.2 (63)	2.9 (20)	1.0 (25)	35	5.6 (2)
Ardo Ezicalve Caspian 6159	Hereford	13	3 (37)	3.1 (50)	1.2 (15)	13	5.74 (59)
Ardo Fargo 1154	Hereford	11	2.7 (4)	2.7 (5)	0.4 (69)	11	5.66 (16)
Beechwood Doubtless	Hereford	11	3 (37)	3.0 (23)	0.8 (41)	11	5.66 (16)
Beechwood Turk	Hereford	19	2.9 (22)	3.0 (24)	0.4 (69)	19	5.66 (16)
Bluestone 080014	Hereford	19	2.8 (12)	3.0 (28)	0.8 (41)	18	5.69 (36)
Bluestone 120061	Hereford	12	2.8 (8)	2.9 (14)	1.0 (25)	11	5.62 (4)
Bluestone 140015	Hereford	17	3.1 (50)	3.1 (46)	1.0 (25)	17	5.69 (36)
Bluestone 140027	Hereford	9	2.7 (3)	3.1 (47)	1.1 (18)	9	5.67 (26)
Burnfoot Playboy	Hereford	14	3 (28)	3.0 (22)	0.6 (58)	14	5.71 (48)
Colrairie Code Word 13 139	Hereford	15	3 (35)	3.4 (66)	1.6 (1)	12	5.73 (57)
Craigmore Baton 140337	Hereford	18	2.8 (7)	3.4 (67)	0.9 (33)	15	5.8 (66)
Craigmore Opium 10214	Hereford	14	3.1 (56)	3.0 (35)	0.5 (68)	14	5.67 (26)

Sire	Breed	n	Marble score	Fat colour Score	Meat colour Score	n pH	Ultimate pH
Craigmore Opium 150206	Hereford	5	3.1 (45)	2.7 (7)	0.2 (73)	5	5.61 (3)
Flagstaff Big Red E8	Hereford	11	2.8 (6)	2.8 (10)	0.7 (48)	10	5.67 (26)
Flagstaff Dynamo G6	Hereford	16	2.9 (19)	3.1 (41)	0.8 (41)	15	5.72 (55)
Haumoana Accent 14032	Hereford	26	2.7 (5)	3 (24)	0.6 (58)	15	5.78 (63)
Kairaumati Coal Face 1482	Hereford	11	3 (33)	2.7 (8)	0.7 (48)	10	5.64 (10)
Koanui Bedford 4081	Hereford	10	2.9 (22)	3.0 (24)	0.8 (41)		
Koanui Briton 2044	Hereford	9	3.2 (63)	3.5 (71)	0.7 (48)	9	5.7 (44)
Koanui Rocket 0219	Hereford	25	3 (31)	3.3 (61)	0.8 (41)	25	5.71 (48)
Koanui Unanimous 0408	Hereford	14	2.8 (8)	3.0 (28)	0.6 (58)	14	5.67 (26)
Limehills Awesome X117	Hereford	13	2.7 (2)	2.8 (9)	0.3 (72)	13	5.73 (57)
Limehills Stamper 120719	Hereford	16	3.2 (58)	2.8 (12)	0.4 (69)	16	5.7 (44)
Mahuta Kimo 4029	Hereford	5	3 (39)	3.5 (70)	1.3 (8)		
Maranui Hick 11-62	Hereford	6	3.2 (61)	3.9 (73)	1.0 (25)		
Mataouri Koa 09 99	Hereford	10	3.2 (58)	3 (32)	1.2 (15)	10	5.72 (55)
Okawa Marshall 0109	Hereford	6	3.2 (66)	2.5 (1)	0.6 (58)	2	5.78 (63)
Orari Gorge Mischeif 120083	Hereford	10	2.9 (20)	3.0 (37)	1.0 (25)	10	5.71 (48)
Otapawa Spark 3060	Hereford	22	3.1 (53)	3.3 (64)	0.9 (33)	22	5.69 (36)
Otengi Wisco 23	Hereford	6	3.1 (47)	3.2 (57)	0.9 (33)		
Platform Quebec	Hereford	13	2.9 (15)	3.2 (59)	0.6 (58)	13	5.63 (7)
Riverton Baltic 09 183	Hereford	15	3 (28)	3.0 (35)	0.8 (41)	15	5.65 (14)
Te Taumata Deluxe 12520	Hereford	11	2.9 (14)	3.0 (37)	1.3 (8)	11	5.67 (26)
Westholm Koala K13	Hereford	19	3.1 (56)	3.1 (41)	0.6 (58)	19	5.75 (60)
Wirruna Daffy D1	Hereford	14	3.5 (72)	3.4 (68)	0.9 (33)	13	5.75 (60)
Wirruna Echuca 99	Hereford	11	2.9 (16)	2.6 (2)	0.8 (41)	4	5.63 (7)