

An across breed comparison of Irish versus New Zealand ovine genetics


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Introduction



2.47 million
breeding ewes

Generate genetically superior animals that will increase overall farm profitability



Enhancing the
rate of
genetic gain
at farm level



Increase production
efficiency

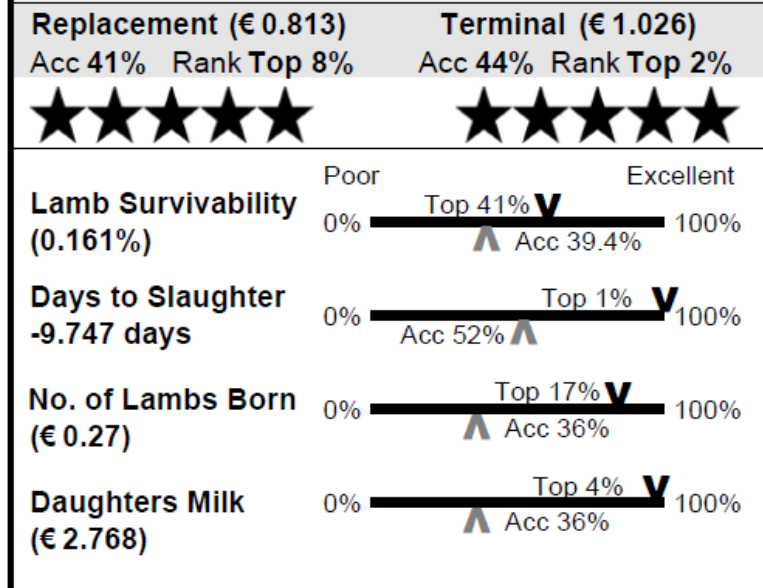


Improve product quality

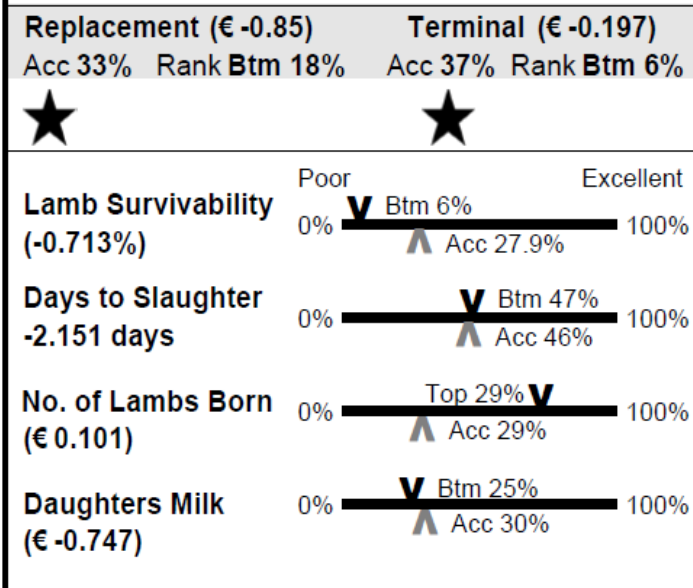
Background



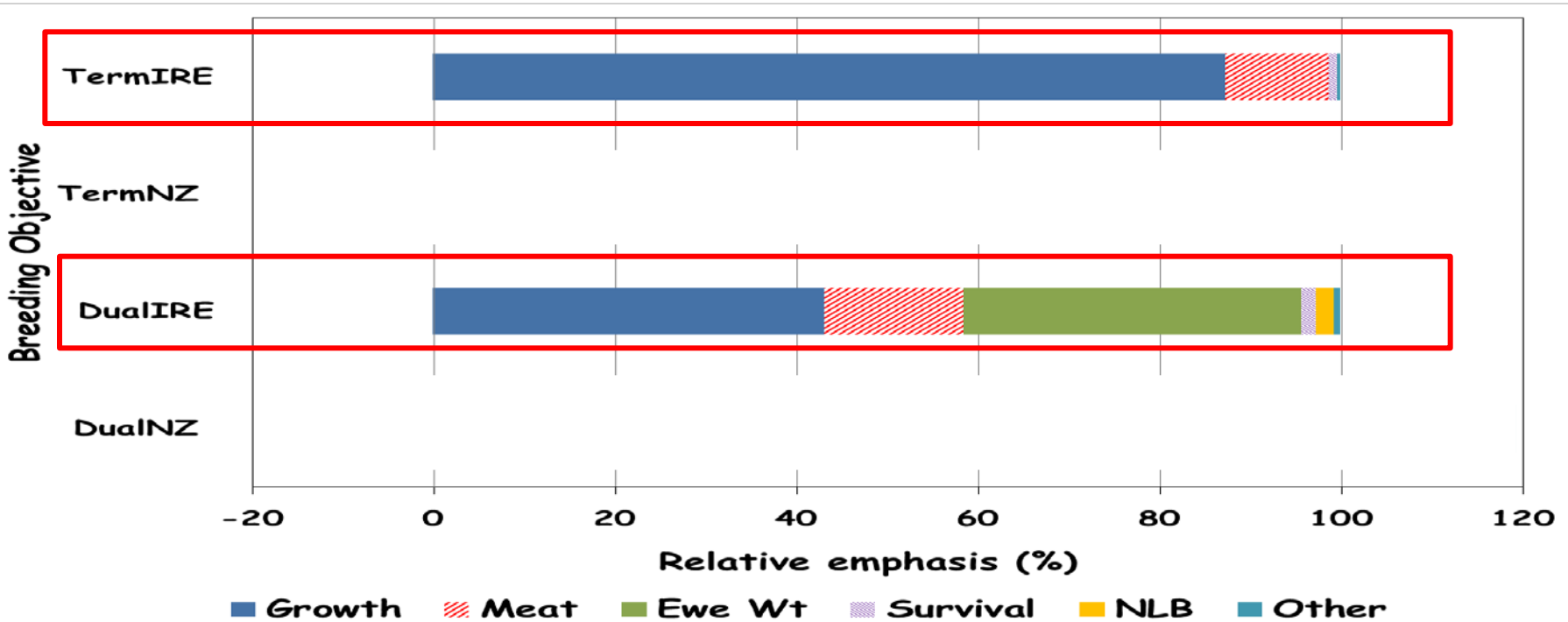
€uro-Star Indexes 11/07/2016



€uro-Star Indexes 11/07/2016

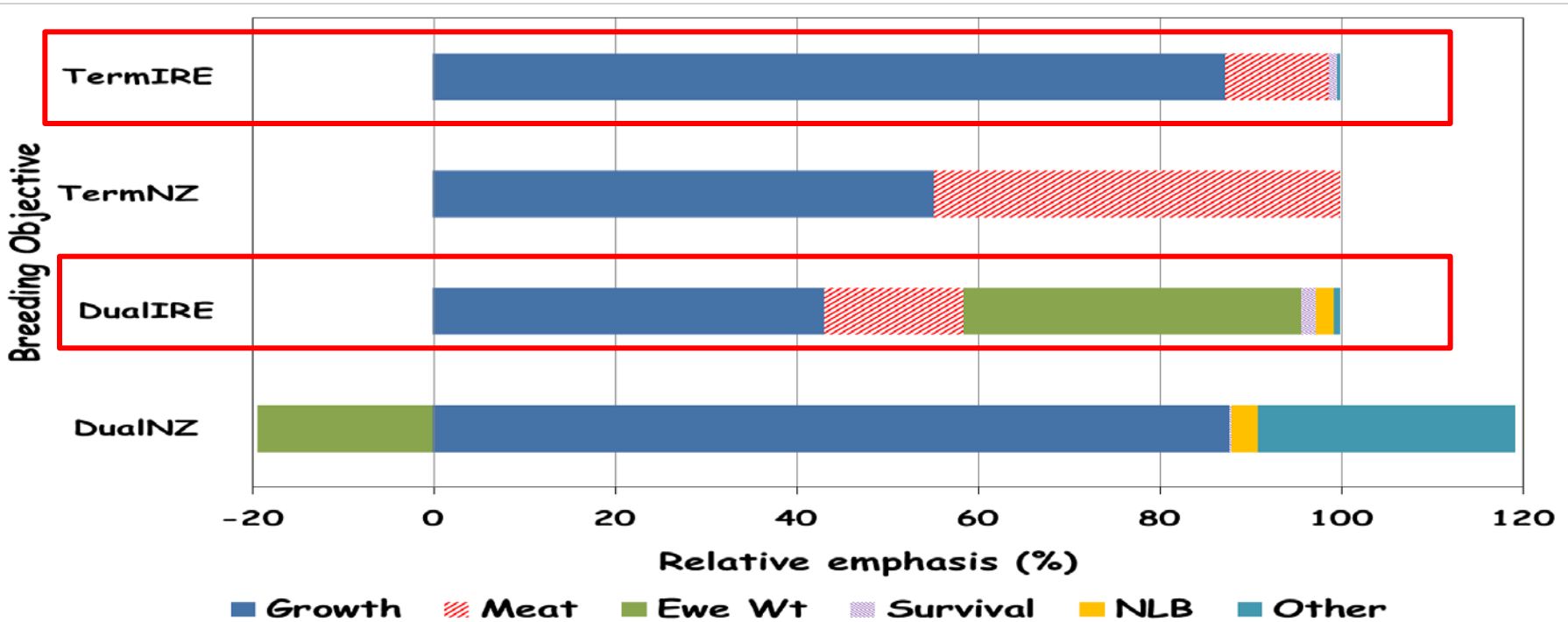


Genetic Indexes



Santos et al. 2015

Genetic Indexes



Santos et al. 2015

Correlations

Term_{IRE}

Dual_{IRE}

Similar breeding objectives but animals have
not been compared in a common environment

Dual_{NZ}

0.52

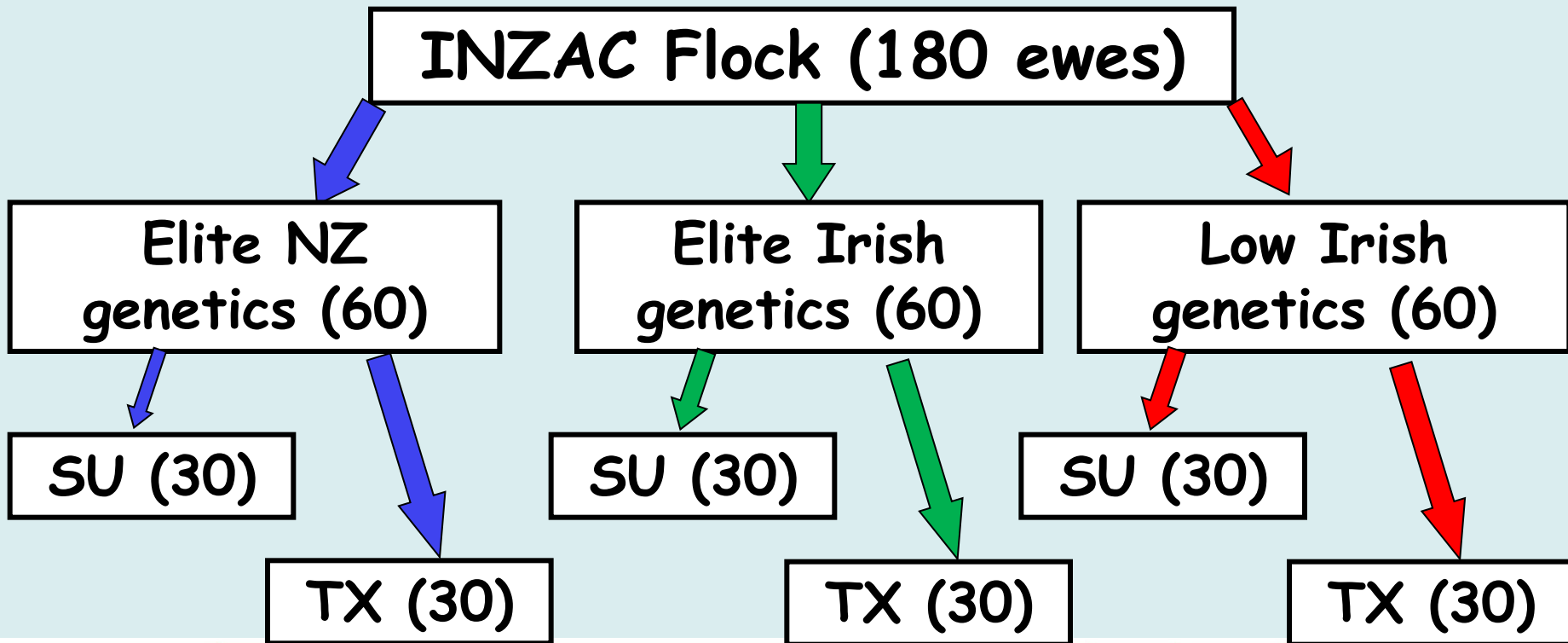
0.86

Objectives

1. To establish the **rate of genetic gain** achievable in the Irish sheep population
2. Compare NZ versus Irish **genetic elite animals**
3. Generate **genetic linkage** between NZ and Ireland:
 - ❖ across country evaluations
 - ❖ Genomic selection



Study Design





Study Design



INZAC Flock (180 ewes)



Elite Irish

€uro-Star Indexes 11/07/2016

	Replacement (€ 0.813)	Terminal (€ 1.026)
	Acc 41% Rank Top 8%	Acc 44% Rank Top 2%
	★★★★★	★★★★★
Lamb Survivability (0.161%)	Poor 0% Top 41% V 100% Acc 39.4%	Excellent
Days to Slaughter -9.747 days	0% Top 1% V 100% Acc 52%	
No. of Lambs Born (€ 0.27)	0% Top 17% V 100% Acc 36%	
Daughters Milk (€ 2.768)	0% Top 4% V 100% Acc 36%	

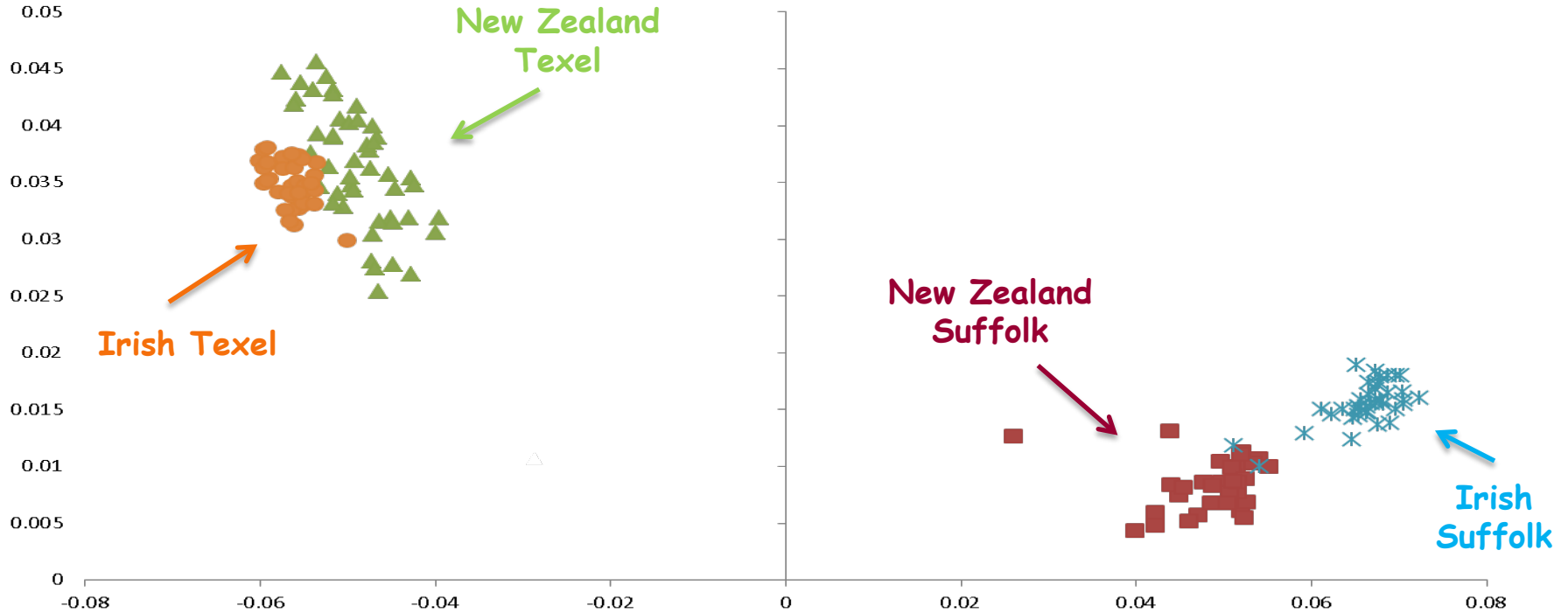
Low Irish

€uro-Star Indexes 11/07/2016

	Replacement (€ -0.85)	Terminal (€ -0.197)
	Acc 33% Rank Btm 18%	Acc 37% Rank Btm 6%
	★	★
Lamb Survivability (-0.713%)	Poor 0% Btm 6% V 100% Acc 27.9%	Excellent
Days to Slaughter -2.151 days	0% Btm 47% V 100% Acc 46%	
No. of Lambs Born (€ 0.101)	0% Top 29% V 100% Acc 29%	
Daughters Milk (€ -0.747)	0% Btm 25% V 100% Acc 30%	

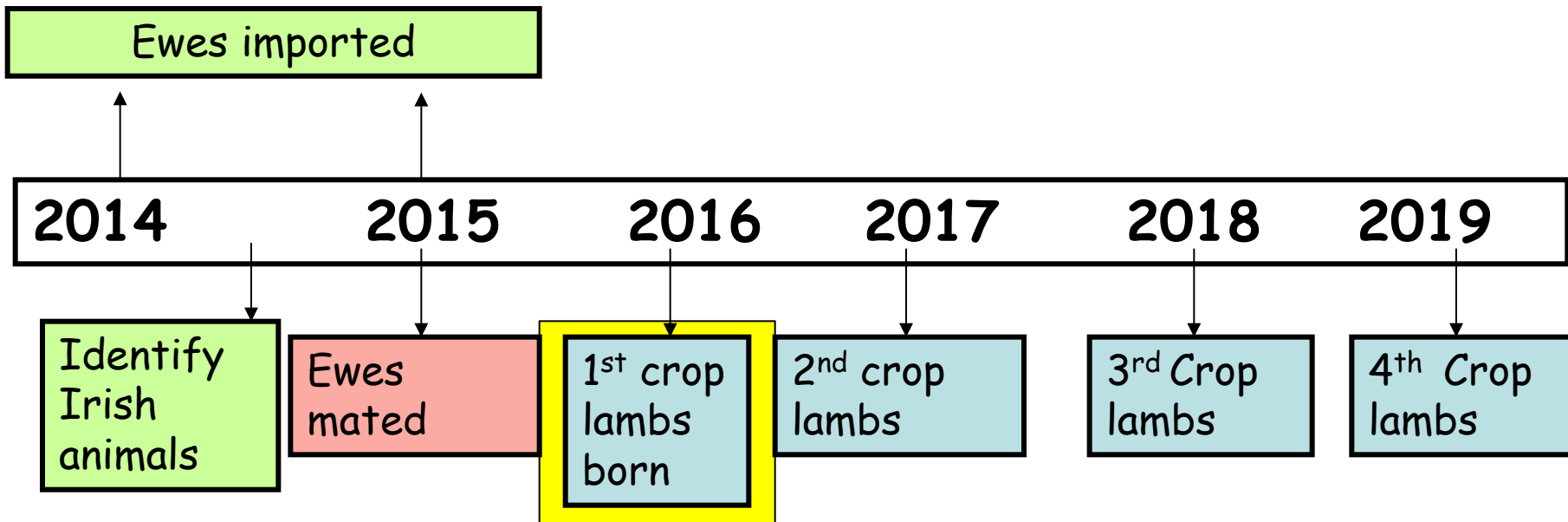


Population Structure





Timeline





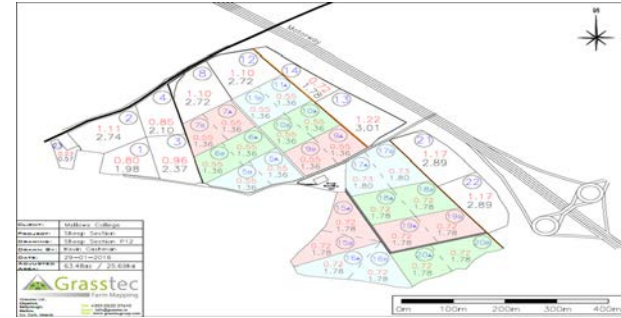
Grazing Management



Three independent farmlets:

- ❖ Farmlet Area - 5ha
- ❖ SR - 12 ewes / ha
- ❖ 150kg N / ha / yr

	NZ	Elite Irish	Irish Low
Target pre graze height, cm	7-9	7-9	7-9
Target post graze sward height, cm	4.15	4.15	4.15





Results

The effect of ewe genotype on pre-partum performance

	NZ	Elite Irish	Irish Low	SEM	P value
Held to first service, %	82 ^a	79 ^{ab}	70 ^b	5.2	0.03
Barren, %	16 ^a	11 ^{ab}	6 ^b	5.6	0.03
Lambing Rate	1.49	1.51	1.49	0.144	NS
Litter size	1.85 ^x	1.65 ^y	1.66 ^y	0.082	0.06

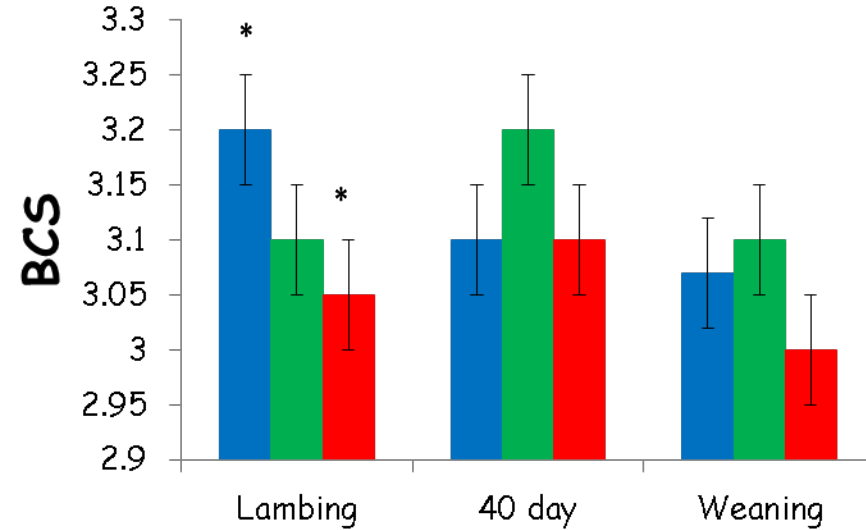
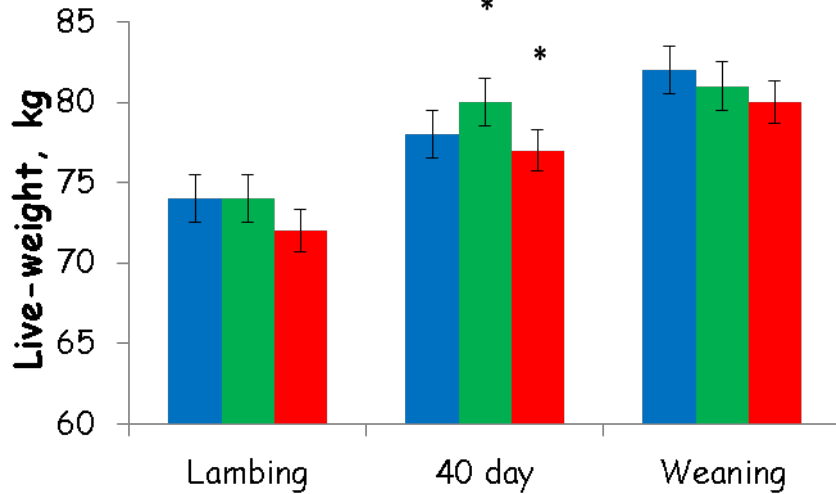
The effect of ewe genotype on lambing performance

- Lambing commenced on February 27th

	NZ	Elite Irish	Irish Low	SEM	P value
Lambing Date	8 th March ^a	10 th March ^b	11 th March ^b	1.1	0.01
NLB	1.92 ^a	1.71 ^b	1.70 ^b	0.076	0.04
Birth weight	4.87	5.09	4.83	0.199	NS
Lambing difficulty	59% ^a	71% ^b	74% ^b	5.3	0.05
Lamb Mortality	6.1%	7.2%	5.1%	3.24	NS

The effect of genotype on ewe performance

* $P < 0.05$



■ NZ ■ Irish High ■ Irish Low

The effect of genotype on ewe health post-partum

	NZ	Elite Irish	Irish Low	SEM	P value
Trait, %					
Mastitis	8 ^{ab}	12 ^a	3 ^b	2.8	0.02
Lameness	3 ^x	8 ^{xy}	12 ^y	3.6	0.07

The effect of genotype on lamb performance pre-weaning

	NZ	Elite Irish	Irish Low	SEM	P value
Weight, kg					
Birth	4.87	5.09	4.83	0.199	NS
40 day	17.8	18.4	16.9	1.20	NS
Weaning	32.6	31.2	30.6	1.52	NS
ADG (g/kg)					
0-6	309 ^a	335 ^b	295 ^a	15.0	0.01
6-14	240 ^a	214 ^b	249 ^a	15.8	0.02
0-14	277	267	260	16.1	NS



Summary



- ❖ New Zealand ewes had higher conception rates to first service and litter size despite having a higher barren ewe percentage
- ❖ Despite similar live-weight, NZ ewes had a higher BCS than Irish ewes at lambing
- ❖ Genotype had no effect on lamb mortality, birth weight or weaning weight
- ❖ Elite Irish genetic merit lambs had higher growth rates to six weeks



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Thank you for your attention,
Any Questions?

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