

CPT objectives and outcomes

Neville Jopson, AbacusBio Ltd



Aims of the Central Progeny Test

- Increase the genetic merit of the NZ sheep flock
- Foster links between ram breeding groups (strengthen genetic connections) for NZGE
- Develop genetic parameters for, and industry understanding of, novel traits
- Genetic resource for research outside of the Central Progeny Test



Central Progeny Test history

- Established as the Alliance CPT from 2002/3 to 2004/5. Dual Purpose and Terminals evaluated for terminal performance
- M&WNZ Central Progeny Test 2005/6. Daughters retained for maternal trait measurement
- B+LNZ Genetics Central Progeny Test. Up to five CPT sites spanning both North and South Islands, and lowland and hill environments



Central Progeny Test review

- B+LNZ Genetics commissioned an independent review of the CPT programme in 2015
- Reviewer consulted widely with breeders, scientists and other stakeholders at meetings throughout the country
- Report for B+LNZ Genetics Board to consider which recommendations to implement



Main outcomes of the review

- Focus on type of environment where sheep are being farmed
- Divide the programme into two parts
 - Research Hubs – reduce in number, but continue in a similar manner
 - Next Generation sites – young rams and collaborate with industry groups
- One set of SIL breeding values for the entire programme
- Remove the ‘league table’ of CPT ram eBVs



Hub versus NG programmes



Hub flocks	Next generation flocks
R&D flocks – connectedness	Breed specific, industry relevant
Hill and lowland (NI and SI)	Predominantly hill sites - commercial
AI with widely-used (i.e. older) rams	Natural mate using young ‘unproven’ rams
~20 sires evaluated per year	Many rams/year (25 - 40 rams per site)
Link sires between years and between Hub and NG sites	Link sires between years and with Hub sites
Fully funded by BLG	Industry sponsored and partially funded by BLG

CPT Hub ram selection (EOI)

- Call for expressions of interest made in November
- Some spaces allocated for link sires
 - Hub site and year links
 - Links to NG flocks
- Remainder allocated to open call
 - First criteria is the anticipated improvement in connectedness
 - Second criteria is breed and strain representation
 - Third has been “special interest” rams, e.g. 1990s sires
 - Options for sponsored rams

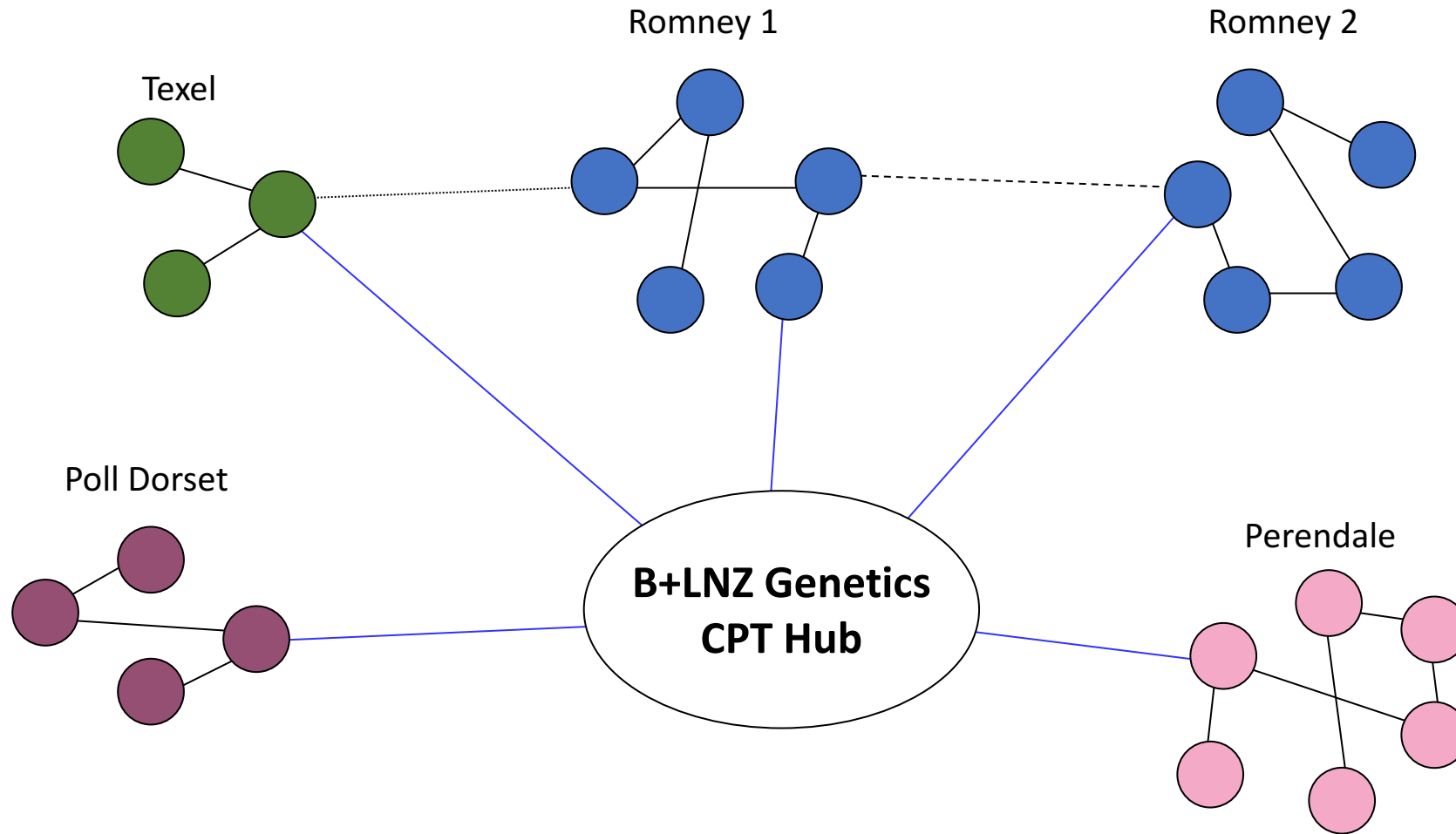


NZGE

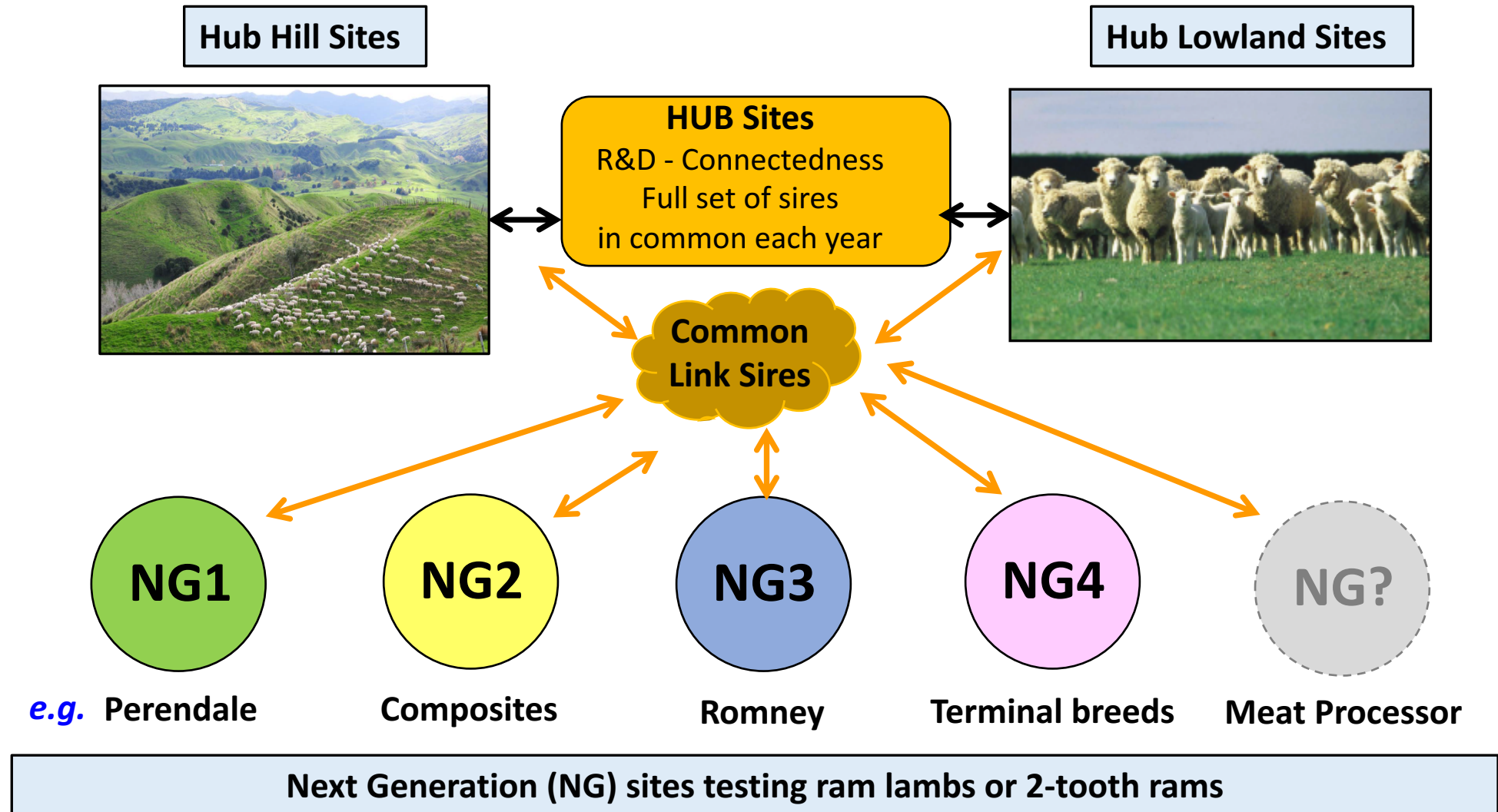
- New Zealand Genetic Evaluation
- National across-flock and breed evaluation
- Adequate connectedness is vital for accuracy of NZGE
- CPT Hubs provides across-breed connectedness that does not happen elsewhere in industry
 - Is it enough?



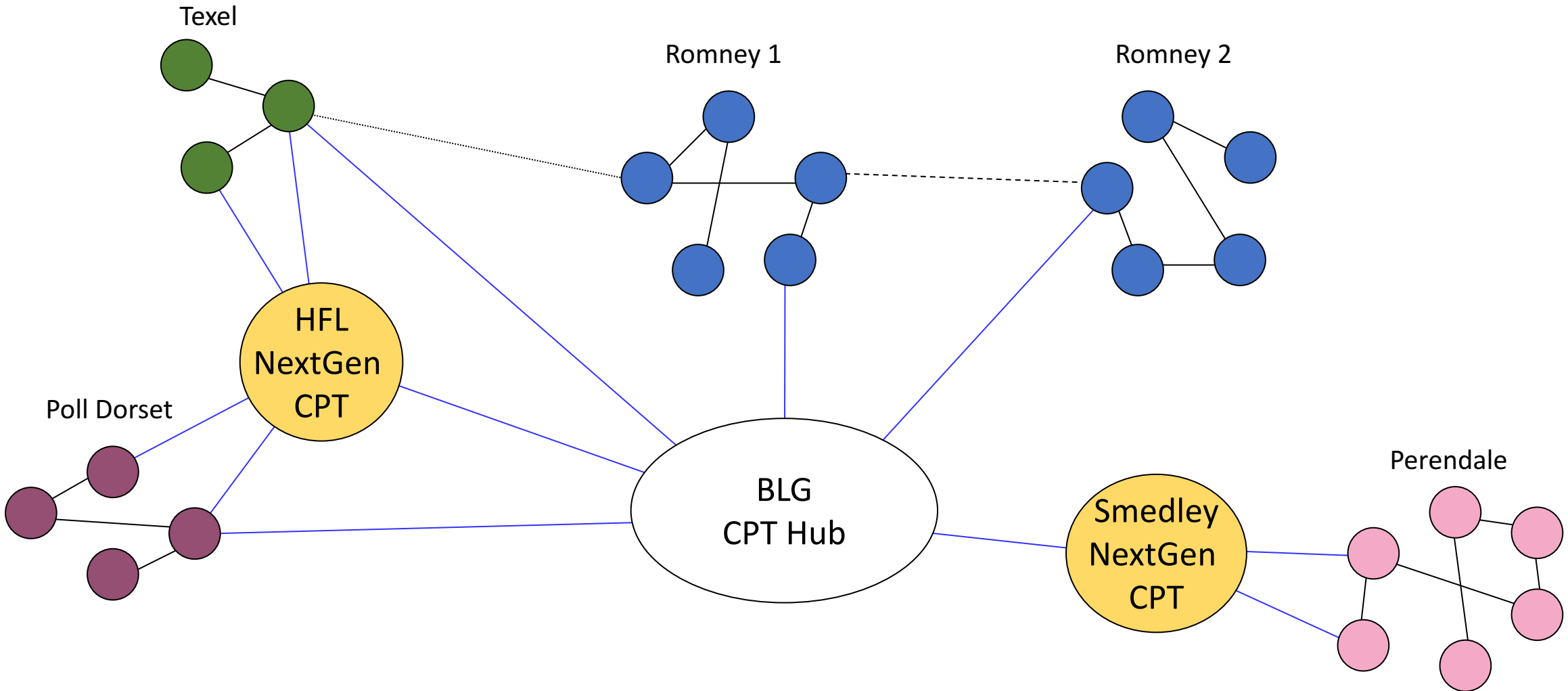
Industry genetic connections



Central Progeny Test Review



Industry genetic connections



Restructuring the Hub sites



Hub flock	2015	2016	2017	2018	2019
Invermay					
Taratahi					
Ashley Dene		Withdrawn – ewes to IVY			
Poukawa		No CPT matings, 3 year classes of ewes	No CPT matings, 2 year classes of ewes	No CPT matings, 1 year class of ewes	
Onslow View			No CPT matings, 3 year classes of ewes	No CPT matings, 2 year classes of ewes	No CPT matings, 1 year class of ewes

Hub sire evaluations

- 351 sires from 42 breeds have been evaluated
 - 23 Terminal Sire, 20 Dual Purpose
- 22 new 'proven' rams mated by AI in March/April 2017
- Significant number of rams (>130) with maternal breeding values



Industry benefits delivered

- Created and maintained genetic connections, and stimulated additional connections
- Across-breed genetic connections needed for NZGE
- New genetic parameters (e.g. SIL meat module)
- Resource for additional research
 - meat quality, lamb survival, internal parasites, greenhouse gas emissions, wool parameters

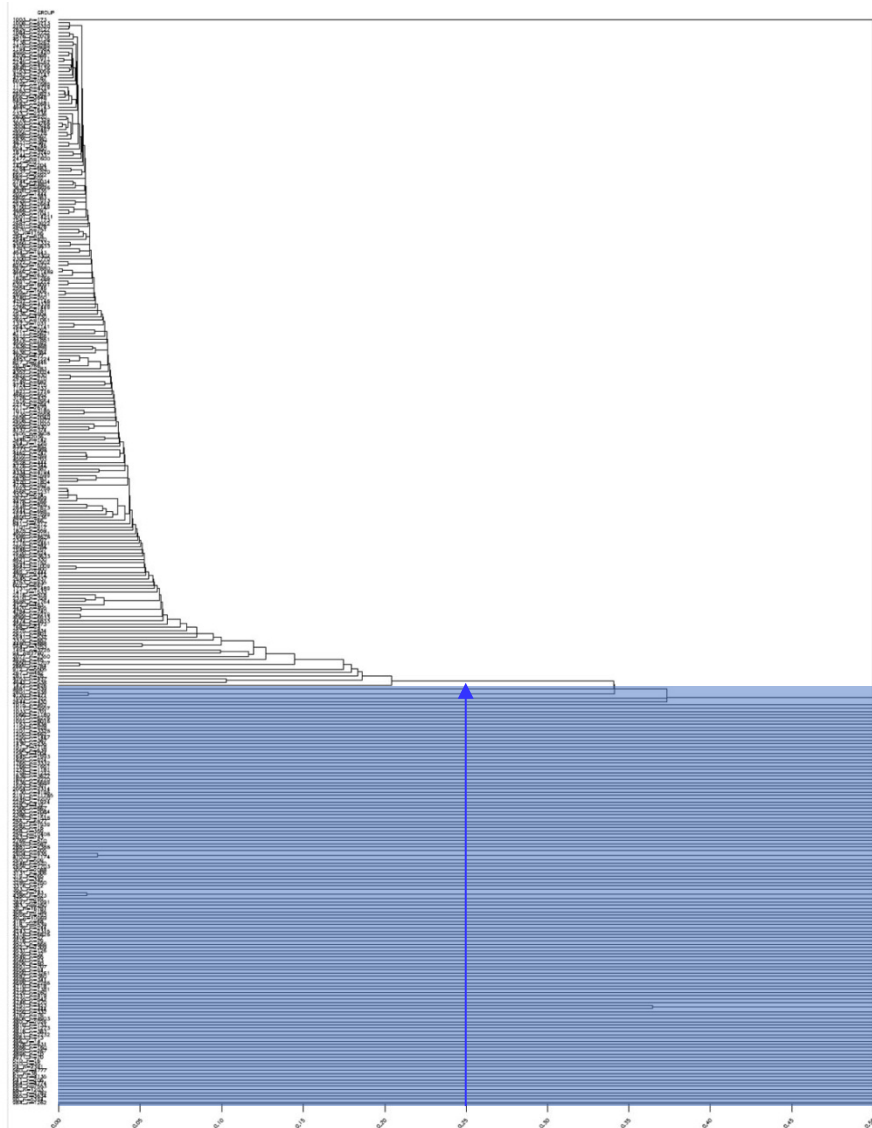


ACE linkage analysis: Meat goal trait group

Including CPT Hubs



SHEEP
BREEDER
FORUM



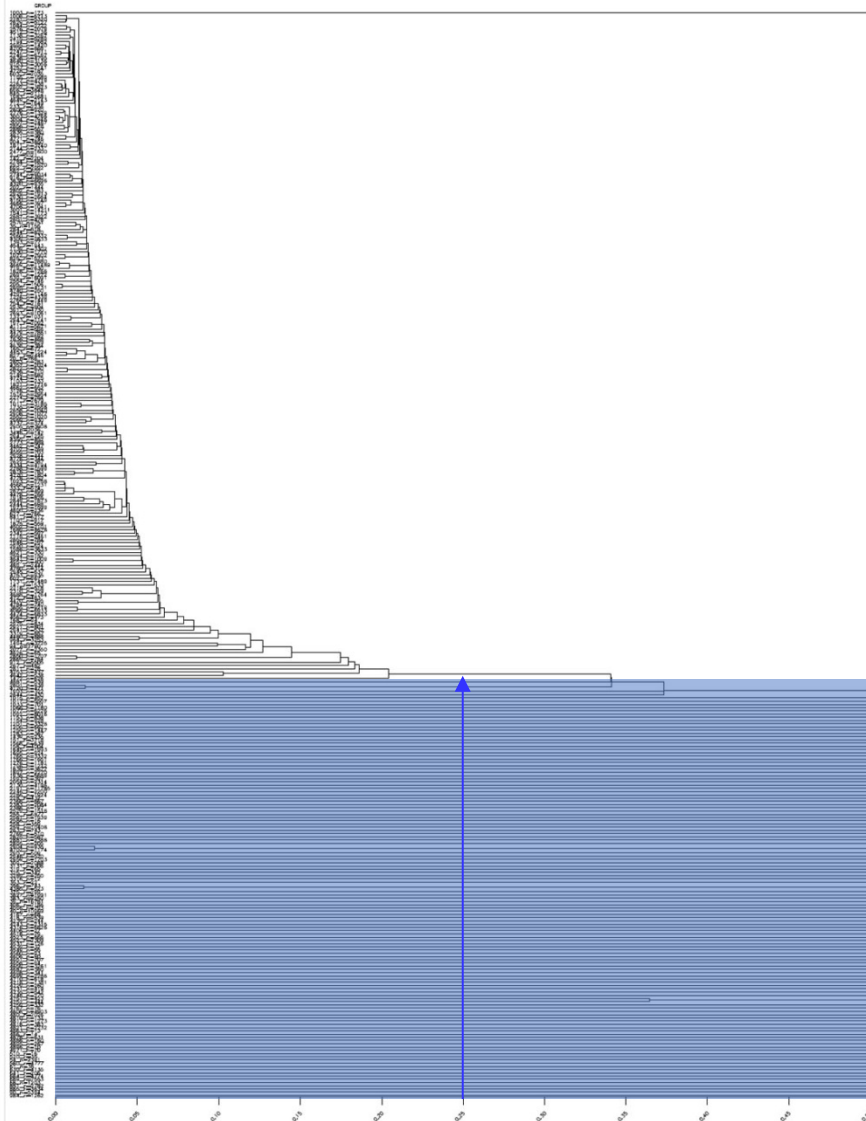
ACE linkage analysis: Meat goal trait group

Including CPT Hubs

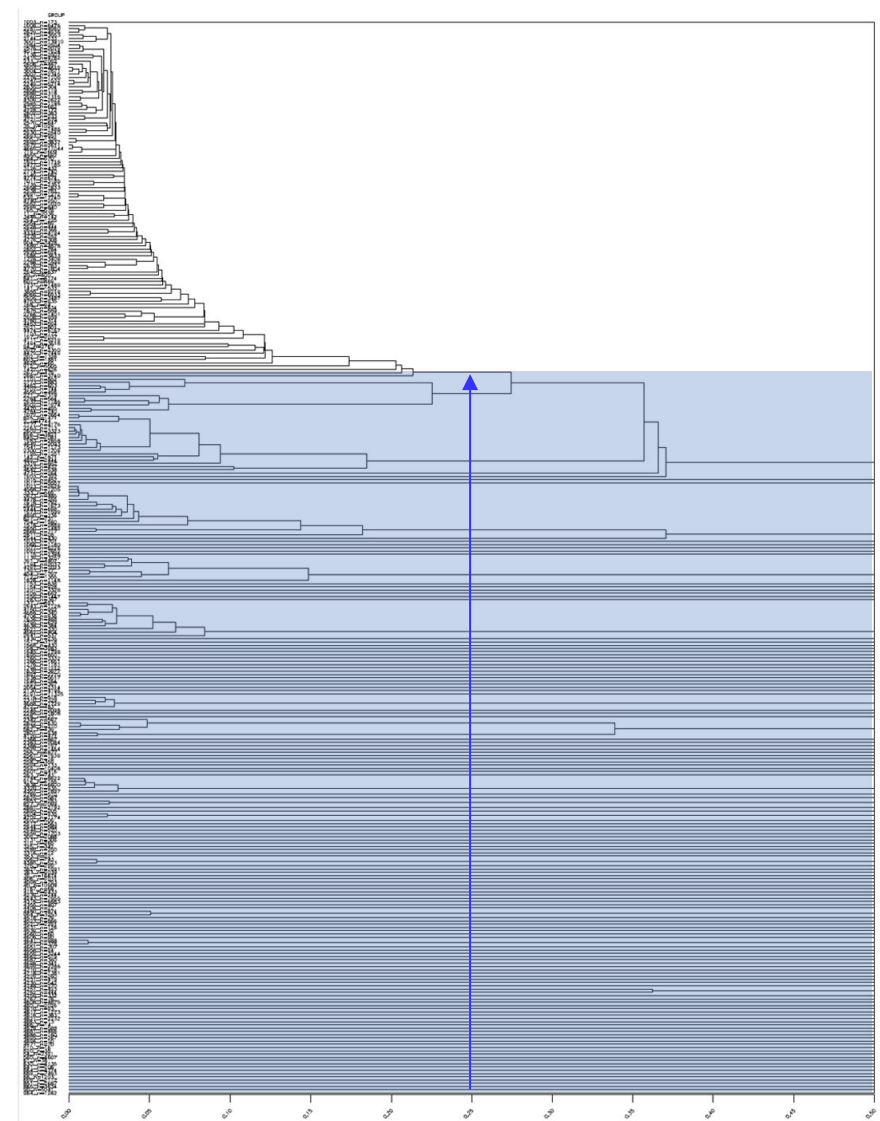
Excluding CPT Hubs



SHEEP BREEDER FORUM



- Poll Dorset
- Perendale
- Corriedale
- Coopworth
- Dorset Down
- Poll Dorset (Supalamb)
- South Suffolk
- Kelso



Genetic parameters

- Meat yield measurements
 - SIL carcass parameters based Dan Waldron's work in late-1980s
 - 1600 Romney and Romney-cross progeny from 102 sires (13.6kg CWT)
 - CPT has >6000 progeny from 351 sires at an average 18kg carcass weight
 - SIL meat module includes Alliance Group's VIAscan system from this dataset, plus ultrasound and CT



Genotype by environment (GxE) interactions

- CPT Hub is a unique resource for study of GxE as most sires used at all sites since 2013
 - Four years of data for growth and meat traits
 - Two years of data for NLB
- An opportunity to see if sire rankings change between hub sites
 - Hill vs lowland
 - Site vs site
- Opportunity to test evaluation models
- Initial results minor GxE for growth, insufficient data for NLB



Add-on projects

- The Central Progeny Test provides a unique sampling of the NZ sheep industry
 - Broadly representative of the range of breeds and crosses in NZ
 - Well recorded on a limited number of sites
 - Ram breeder supply agreement allows for research outside of the Central Progeny Test so long as rams not identified



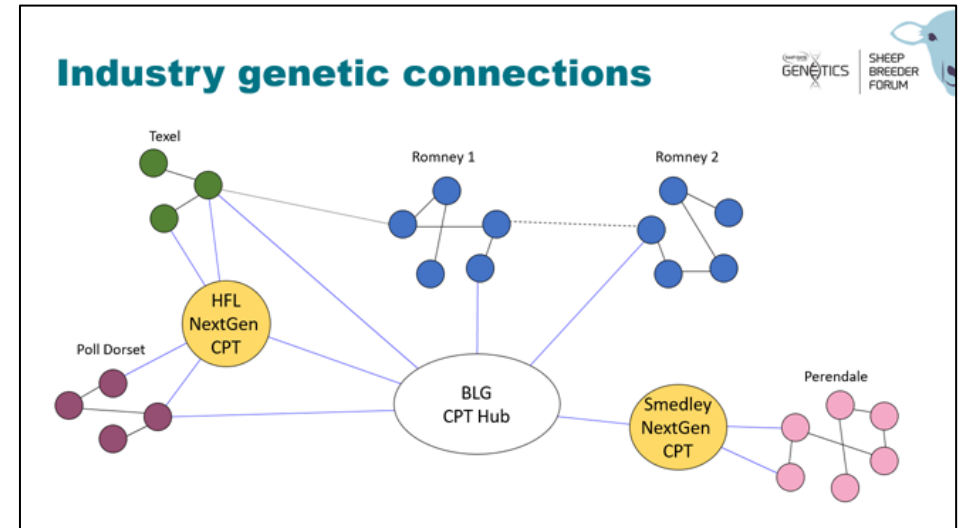
Example add-on projects

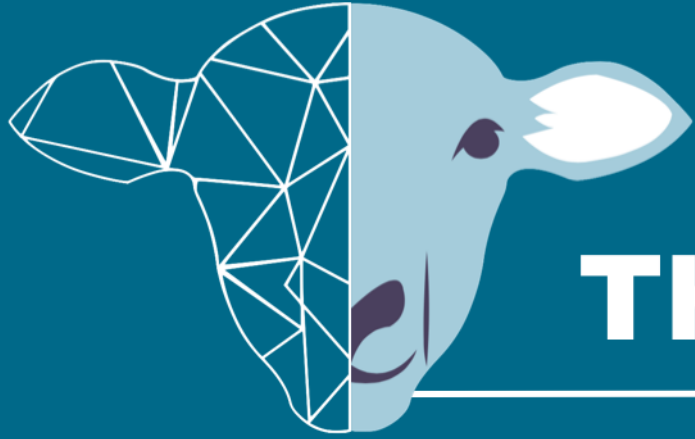
- 31 applications received, 25 approved
- Example projects
 - Greenhouse gas emissions with PGGRC
 - Meat and eating quality with Ovita and Alliance
 - Lamb survival with Ovita
 - Wool fleece measurements with AgResearch
 - RFI



The future role of the CPT Hub programme

- Ongoing role in maintaining connections for NZGE
- Current research focus is GxE interactions
- Resource for other programmes
 - E.g. Genomic selection, RFI etc





Thank you.