From Drafthorse To Drone

Technology developments

U3A Presentation - 9 March 2026

Dr Ken Geenty

Outline of Presentation

- Introduction

  * Childhood
  * NZ work career
  * Aussie experience

- Genetics from a drop of blood
- e-sheep weighing/autodrafting
- Drones on farms
- Farmer adoption groupings

Experiences from childhood and work career

- Childhood – sawmilling village & farm
  1940s & 50s
- Education – Massey, Lincoln Universities
  1962 - 72
- Work career – AgResearch, NZWB
  1972 - 2003
- Aussie Sheep CRC experience
  2004 - 2014

Childhood

Sawmilling village and farm

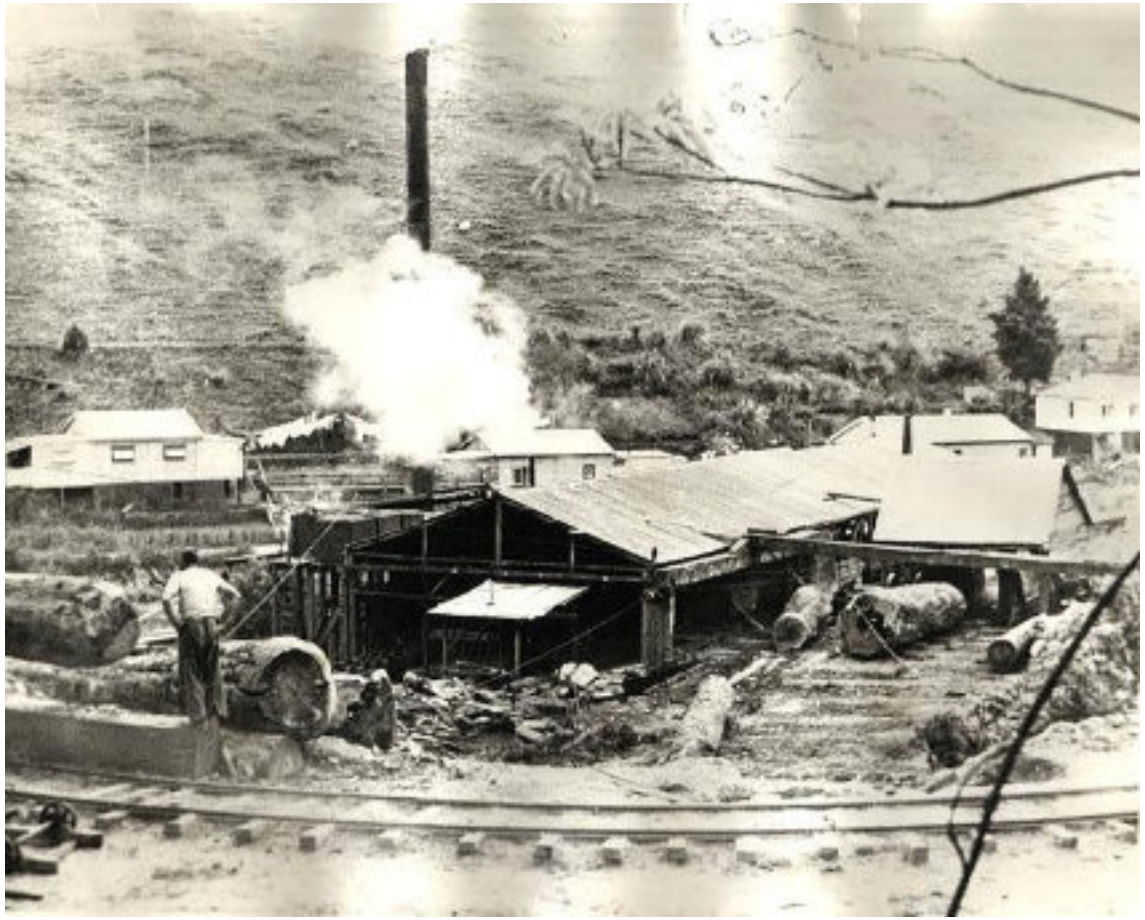
Cashmore Bros at WaWa, South Waikato

My dad was General Manager

Our family in 1947and the sawmill

Geenty kids 1947

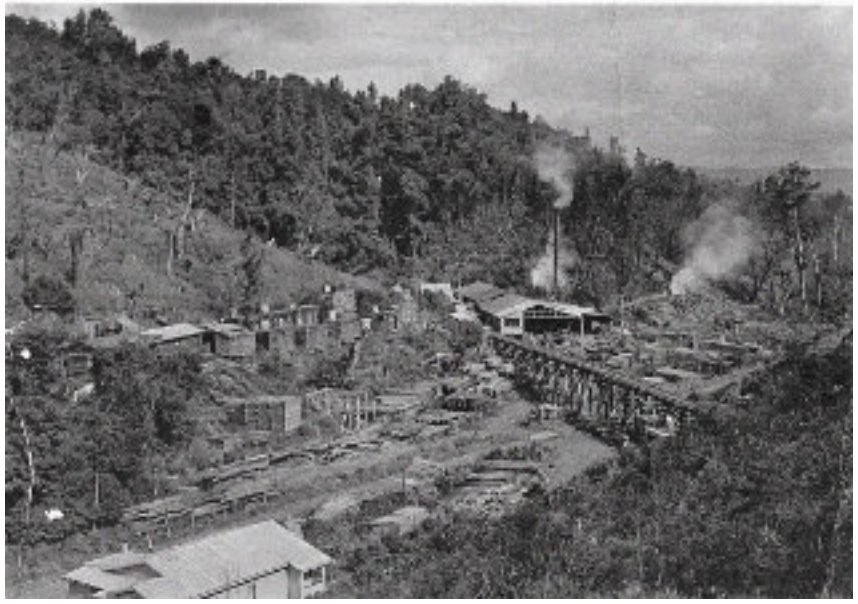
Steam powered sawmill - 1942



Cashmore's sawmill workers – early 1940s

Boss and father Con at centre with his office worker Dawn Harpur

The steam-powered sawmill 1940s 60s



Single men's huts – early 1940s

Cashmore's bushmen tree felling – the old way!

Jimmy Wilson (right in each) & Dick Yates felling a large totara for the sawmill

12year old Ken on his favourite stock horse Trigger, Cashmore's farm 1956

And Trigger with Gusta Peach below

My Decade in Aussie

- Getting the Sheep CRC job
- The Sheep CRC
- New technologies
  - DNA genetics
  - e-sheep
  - CRC outcomes

SheepCRC – 20 Participants

In kind from each participant plus $35m yearly from Govt

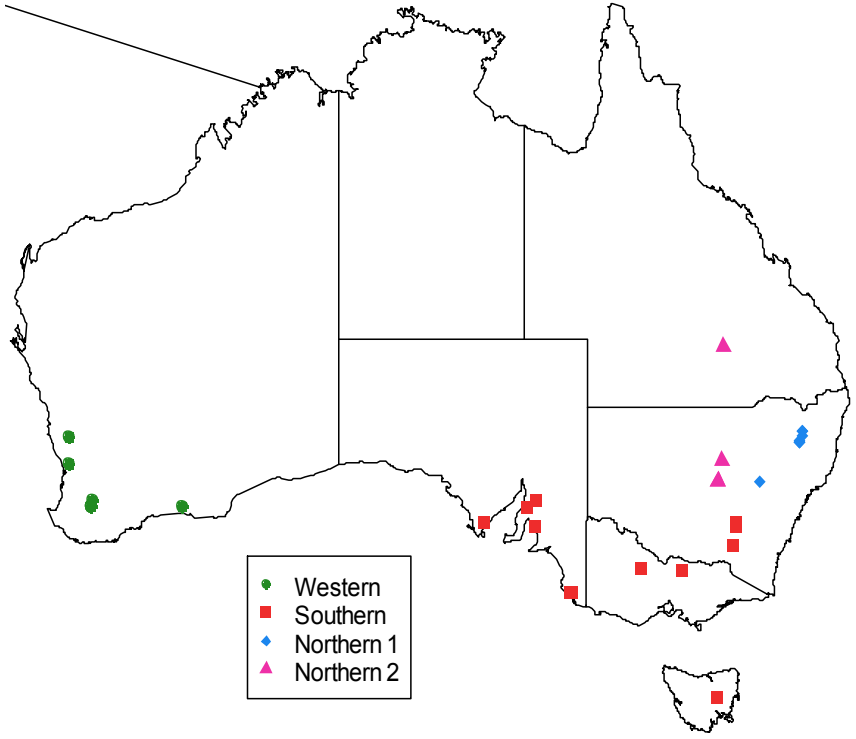
Focus on technology delivery

My work places across Aussie between 2004 and 2014

(with the Sheep Cooperative Research Centre)

Five research stations where I supervised projects

25 Merino farmers we used for 'on farm' application of the technology

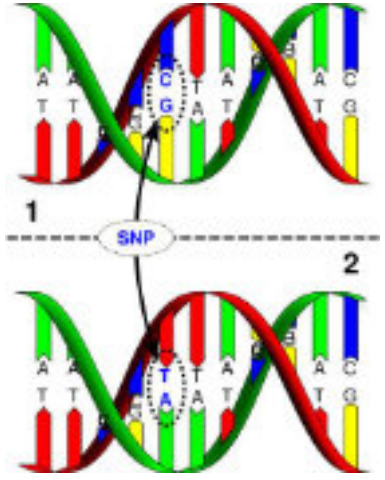


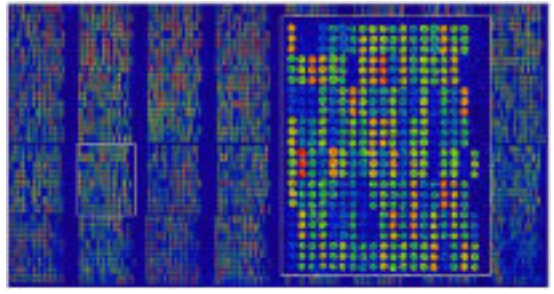
Use of DNA Protein

(Deoxy-ribo-nucleic-acid)

- Rapidly developing technology
- Becoming cheaper
- Unfolds the genetic keys to production

DNA sequences





SNP chip

DNA SNPs can measure different genotypes

Different Phenotypes

Two rams with different phenotypes – their visual characteristics and their objective performance differs

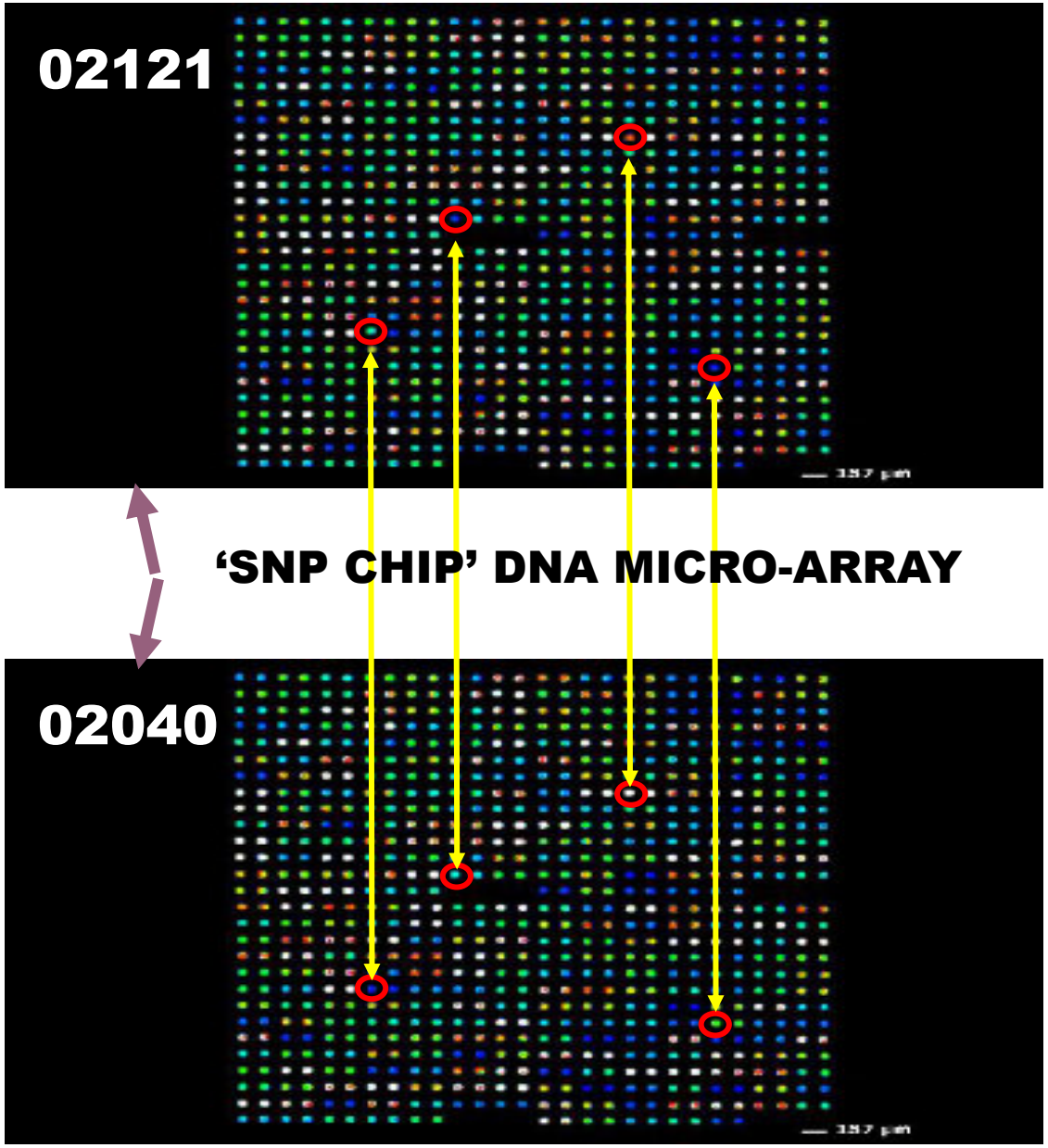
Visual appearance

Different Genotypes

Our DNA technology allows measured associated differences in genotypes using SNPs - chunks of DNA called:

Single Nucleotide Polymorphisms

Different Genotypes



2 SNP chips – one shown for each animal

Each dot represents a SNP or *Single Nucleotide Polymorphism*

Red circles show 4 SNPs being compared

Yellow lines connect the equivalent SNPs on each animal's chip.

These animals differ at the highlighted SNP positions.

This chip has less than 1000 SNPs

There are chips with many 1000s of SNPs

E-Sheep Technology

Weighing and Aut o-drafting

- Depend on radio-frequency ear tags which are automatically recorded as sheep pass the scanner
- One person can weigh/autodraft 400 sheep per hour
- Human error is eliminated through electronic tag read/data capture
- Data can be rapidly organized and uploaded to a computor/database

What is the Aussie SheepCRC delivering?

* next generation genetic tools for *

- Easy care sheep
  - Disease resistant
  - Low death rates
- Greater demand for wool
  - Improved comfort
  - Better colour stability
- More nutritious sheep meat
  - Better muscling, more tender and flavoursome
  - Better human nutrition (iron, omega3)
- More effective industry adoption
  - Engagement with industry partners

Drone Surveillance

(New Zealand & Australia)

- Checking livestock
- Water points
- Security
- Photography

Farmer Adoption Groups

- Early adopters/innovators (15-20%)
- Status quo/solid grafters (70-80%)
- Lagards (<5-10%)