

The New Zealand Institute for Plant & Food Research Limited

Plant & Food
RESEARCH

RANGAHAU AHUMĀRA KAI

A close-up photograph of several green leaves. The leaves have prominent, intricate vein patterns and serrated (toothed) edges. The lighting is bright, highlighting the texture and vibrant green color of the foliage. The leaves are layered, with some in sharp focus and others slightly blurred in the background.

Plant & Food Research

The Kiwis

- Vincent Borgers, systems analyst
- Eric Burgueno, systems engineer
- Charles David, bioinformatician
- Marcus Davy, bioinformatician
- Matthew Laurenson, manager science and business solutions
- Andrew McLachlan, biometrician
- Roy Storey, bioinformatician, programme leader
- Helge Dzierzon, team leader bioinformatics

New Zealand vs. North Carolina

- NZ: ~100,000sqm
- NC: ~50,000sqm
- NZ: ~4.5Mio people
- NC: ~10Mio people
- NZ GDP ~\$185 Bill (2013)
- NC GDP ~\$400 Bill (2007)
- NZ establishment 6 February 1840
- NC Independence 1775
- NZ first settlers 1300
- NC first settlers 10-15,000 years ago



NZ Facts

- Kiwi Nancy Wake was the Gestapo's most wanted person during World War II. She once killed a SS sentry with her bare hands.
- In 1990, the NZ prime minister appointed a National Wizard.
- The national sport of NZ is rugby union.
- The first man to climb Mt. Everest, Sir Edmund Hillary, was a Kiwi.



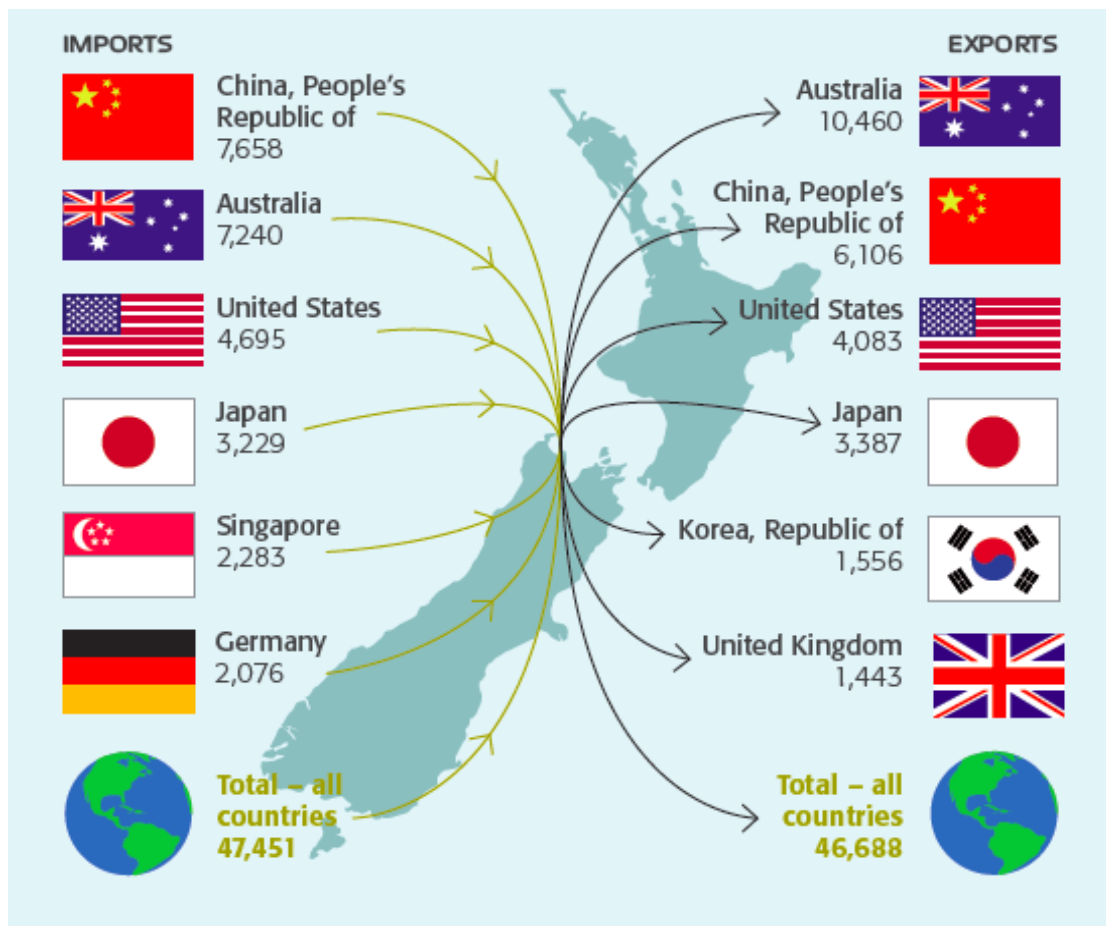
Longest Place Name



Maori



Import Export 2013



OUR OUTCOMES & IMPACT

CORE
MEASURES OF
OUR SUCCESS

HIGHER
PREMIUMS

HIGHER
SUSTAINABILITY

HIGHER
MARKET SHARE

HIGHER
MARGINS

2025 FUTURE ECONOMIC VALUE



Our science

Our science combines market insight with a fundamental understanding of the biology of our food resources.



Seafood



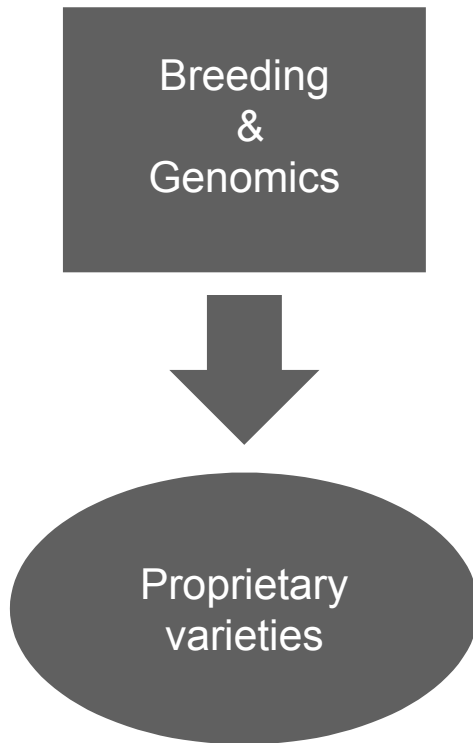
Breeding & Genomics

Better Cultivars Faster

New cultivar development from smart breeding of elite germplasm



Breeding & Genomics



- » New breeding tools to accelerate development of cultivars
- » New cultivars which:
 - » address international consumer trends
 - » are adapted to climatic change
 - » are resistant to key pests and diseases

Breeding & Genomics



Strategy:

- » New cultivars with identified consumer and producer traits
- » Identified molecular mechanisms controlling key traits
- » Breeding programmes using integrated genomics tools

Main research themes:

- » Identifying molecular mechanisms controlling key traits
- » Developing molecular markers for key traits
- » Genotyping and phenotyping of germplasm collections
- » Developing new technologies to support breeding programmes
- » Breeding of new cultivars with defined commercial traits

Breeding & Genomics



ZESPRI® GOLD Kiwifruit

- » Sweet, yellow-fleshed kiwifruit
- » More than 26 million trays sold in 2009

JAZZ™ apples

- » Tangy, crunchy, juicy apples with flavour
- » Rated by consumers in Europe and US as outstanding
- » Excellent shelf life

Moonlight potato

- » Smooth white skinned, white fleshed general purpose potato
- » High yield, good eating

Conquest wheat

- » Improved milling wheat variety
- » Competitive as an import replacement variety

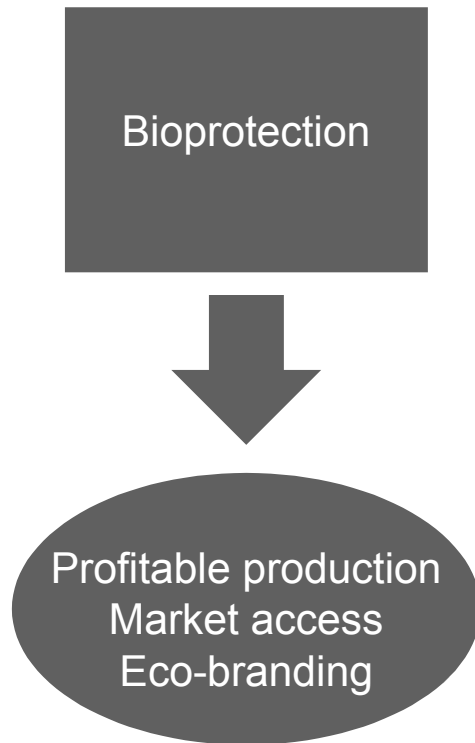
Bioprotection

Residue-Free Pest & Disease Control

Low impact control measures for pest and disease control



Bioprotection



- » Pre- and post-border technologies to eliminate impact of new incursions
- » Targeted pest and disease control technologies and systems that use negligible chemicals
- » Understanding impacts of new technologies

Bioprotection



Apple Futures

- » Three year programme
- » Residue-free fruit
- » Disease prediction, insect monitoring, biocontrol agents
- » 97% of NZ apples meet programme requirements (2010)

Tomato/Potato Psyllid

- » Infects potato, tomato, eggplant, capsicum, tamarillo
- » Potential cost of \$800m to horticulture
- » Development of pest management system with Horticulture NZ
- » Monitoring spread, biological control agents

Food Innovation

Proprietary, Premium Foods & Beverages

Foods with new functionalities, particularly in the human health domain



Food Innovation



Food Innovation



Food products
Food technologies

- » New foods with substantiated health and wellness claims
- » New generation of functional foods
- » Understanding of consumer purchase decisions
- » Food products that enhance the 'NZ Inc' brand



What our Bioinformatics says about PFR



- We started in 2001 with sequencing
 - We know when to invest
 - We do invest in new technology
 - We have the capability to do so
- Riccardo Velasco et al. (2010), The genome of the domesticated apple (*Malus × domestica* Borkh.), Nature Genetics
- Potato Genome Sequencing Consortium (2011), Genome sequence and analysis of the tuber crop potato, Nature

Last words

- Kiwis are Entrepreneurs



Acknowledgements



Prof. Donald Jacobs

Working with industry

