



crop improvement team

The Crop Improvement Team applies conventional and molecular plant breeding techniques to develop new and improved arable, forage and vegetable crops.

CROPSEED

CropSeed commercialises new cultivars produced at Crop & Food Research and currently handles more than 85 cultivars.

CropSeed manages:

- regional testing of advanced lines
- licensee selection, contract writing, royalty collection and relationship management with companies that hold licences for commercial seed sale
- production of breeders' seed for commercial cultivars
- winter nurseries for Northern Hemisphere breeding companies
- joint breeding contracts where co-development of cultivars takes place with industry

team capabilities

The Crop Improvement Team develops new cultivars for New Zealand and overseas markets in collaboration with industry. We also develop genetically variable germplasm for use in research projects, particularly those on processing/nutritional qualities and sustainable production traits.

Our focus is on ways of using genetic diversity to develop new products for substantially new markets rather than continuing to improve existing crop productivity. Three new opportunities for New Zealand agriculture have been identified:

- understanding the materials produced, their performance (e.g. in processing applications and nutrition) and our ability to manipulate them
- using genetic potential to address sustainability issues, including disease and pest management, yield stability, water use efficiency and influence on soil structure
- applying new molecular plant improvement techniques so that niche market opportunities can be quickly exploited.

- international trialling and commercialisation of cultivars.

VEGETABLE IMPROVEMENT

Current breeding programmes include (recent releases in brackets):

- process peas (Ultimo, Astro)
- potatoes (Moonlight, White Delight)
- sweet potatoes (Radical)

ARABLE IMPROVEMENT

Current breeding programmes include (recent releases in brackets):

- oats (Milton, Armstrong)
- wheat (Aquila, Vanquish, Tribute)
- triticale (Crackerjack, Rocket)
- forage brassicas (Goliath, Aparima)



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Some current projects

Individual crop breeding programmes are supported by government and industry. Sources of industry funding include Crop & Food Research, New Zealand companies or sector associations, or companies offshore. Large overseas markets allow potentially high returns to New Zealand, which are reinvested in further crop improvement activities.

MILLING WHEAT

We are breeding milling wheat for Australian high rainfall production zones (HRZ). Crop & Food Research and the Plant Industry Division, CSIRO, have jointly developed a programme that identifies production issues and will produce new cultivars aimed at the higher quality Australian milling wheat classes. The programme has an eight-year commitment from its major funding source, the Export Grains Centre, and is also supported by significant contributions from CSIRO and Crop & Food Research. The similarity between the Australian HRZ environment and much of New Zealand's production area will mean materials produced can be shared by both countries. We have freedom to use this material and any associated breeding technologies within New Zealand to produce new wheats.

CEREAL SILAGE

Whole crop cereal silage is providing a high yielding and low risk supplementary feed source for the expanding South Island dairy industry. Two recently released specialist forage triticale cultivars, Doubletake and Rocket, are superior performers in the cereal silage market. Further standing cereal forage options are provided by specialist oat cultivars such as Milton and Stampede. All of these cereal forage cultivars are also now being grown in the North Island. They are all helping to feed New Zealand's \$8 billion dairy industry, and increasingly other livestock sectors.

POTATOES

Field screening for resistance to powdery scab in potatoes continues to be the main selection mechanism for identifying elite germplasm. However, progress towards identifying genetic markers for resistance may greatly accelerate this selection of resistant potato lines. The resistance data from individual lines tested in a novel greenhouse-based system are used to unravel the genetics of powdery scab resistance and to identify molecular markers associated with it.

RESEARCH TEAM

The team has 37 researchers based at Lincoln, Palmerston North, Pukekohe and Gore.

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