Development of low chill cultivars in New Zealand

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Imported Cultivar Performance
Development of a NZ programme

- Breeding began in 1992 because of tightening plant importation regulations
- Base material primarily from SCRI and East Malling (gall mite resistant)
- 2002 joint programme between Plant & Food Research (PFR) and Blackcurrants NZ (BCNZ)
- Programme managed by BlackHort committee, PFR and BCNZ
NZ Programme Breeding Cycle

- 1000 seedlings planted every year
- 20-30 seedlings selected for advanced selection plots in Nelson and Canterbury
- 1 selection released every year to growers is target

- Compared with other programmes, less testing is done on the cultivars before release.

- NZ growers are part of the testing and development process with a new release.
Objectives of the NZ Programme

On-Farm objectives

• Consistently high fruit yields
  • >10 tonnes/ha

• Growth habit suitable for machine harvesting

• Seasonal spread - late December-early February

• Pest and disease resistance/tolerance
  • Gall mite, currant clearwing, Leaf spot

• Low chill character
Currant Clearwing

• Major pest in New Zealand
• Presently controlled by pheromone mating disruption; however, problems when populations are high
• Breeding for resistance a long-term objective
• Tried to import resistant germplasm, but unsuccessful so far
Selecting for low chill

• Challenge to find a rapid, robust screening test for low chill, as chill is a complicated process

• Collaborating with James Hutton Institute on low chill on project to develop genetic marker for low chill. A cross ‘Ben Dorain’ x ‘Sefton’ planted in both the UK and NZ

• Budstick and budbreak assessments

• Testing near releases at low chill sites
Te Puke
~600-800 hours

Hawke’s Bay
~ 800-1000 hours

Canterbury
~ 1300-1600 hours

35°S

40°S

45°S
End-use objectives

- High quality juice market, 7%+ blackcurrant juice
  - High colour, °Brix, vitamin C, flavour

- Commodity juice market
  - High juice yields, high production

- Other market products e.g. IQF, powder bakery products
Health

• Past emphasis on increasing total anthocyanin levels in selections.

• Research is being carried out in PFR, lead by Dr Roger Hurst on specific anthocyanins and health benefits.

• In the future the breeding programme aims to be breeding for specific anthocyanin combinations targeting specific end use products.
Cultivars from the NZ Programme

**Commercial cultivars**

‘Murchison’- gall mite resistant, high yielding

‘Blackadder’ – high quality juice market cultivar

‘Melina’ – gall mite resistant

**Newer cultivar releases**

‘Isobel’ - Gall mite resistant, possible quality juice market contender

‘Kepler’ – New quality juice market contender released to growers last winter.

5 selections are nearing release - 4 gall mite resistant
Summary

- Small targeted programme
- Future emphasis on low chill selection and currant clearwing (CC) resistance
  - Importation of further CC-resistant material
  - Continued collaboration with James Hutton Institute on low chill project and exchange of material
- Development of cultivars that have particular health benefits