

# Hops – What is the potential and direction?

**Kerry Templeton**



# Introduction



Hops 101  
Brief NZ History (of hops)  
Potential  
Direction  
Industry links





# Hops (*Humulus lupulus*)



- Found in
  - Central Asia
  - Central Europe
  - North America
- » Dioecious
- » Climbing bine
- » Perennial
- » Flowering-
  - day-length sensitive
- » Rich source of secondary metabolites





bract

bracteole

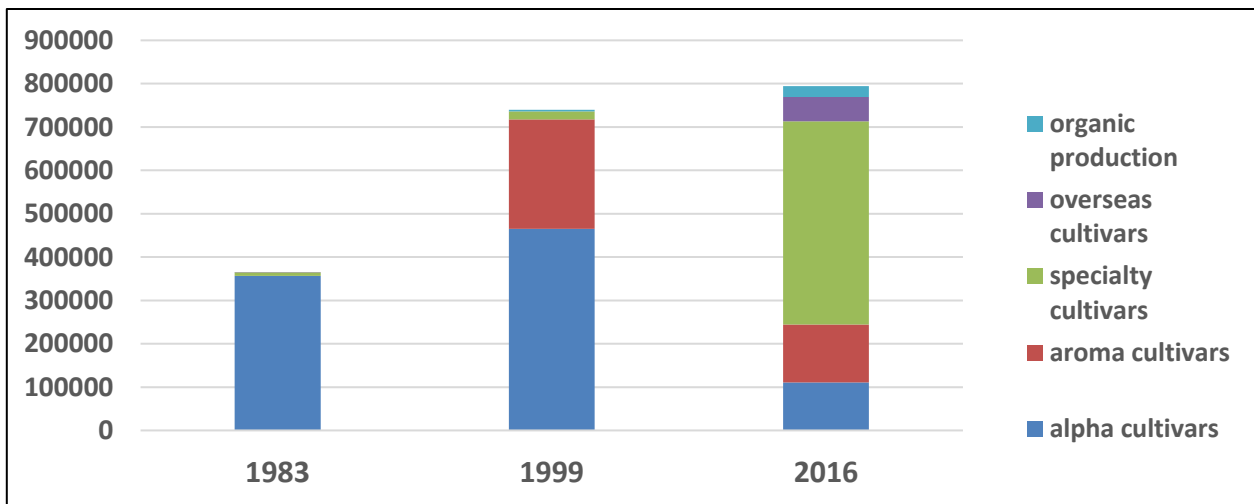
Lupulin  
gland



# Hop growing in NZ

- Hops introduced >150 years ago
- NZ breeding commenced 1950s
  - Disease resistance
- Change in 1980s to “aroma” type
- Change again in 2000s as IPA and hop forward beers changed the demand to “flavour” type hops
- Industry expansion (2015 on)

New Zealand hop production changes (kilograms)



Cultivar name	Year released
Green Bullet™	1972
Sticklebract	1972
Dr Rudi	1976
Rakau™	1983
Pacific Gem™	1987
Wakatu™	1988
Pacifica™	1994
NZ Southern Cross™	1994
<b>Motueka™</b>	<b>1997</b>
<b>Riwaka™</b>	<b>1997</b>
<b>Nelson Sauvin™</b>	<b>2000</b>
Pacific Sunrise™	2000
NZ Pacific Jade™	2004
Wai-iti™	2011
Kohatu®	2011
Waimea™	2012
Moutere™	2015
Nectaron®	2020





# The hop garden



- 5 m trellis
- ~3000–3500 plants/ha (cultivar specific)
- Irrigation
- Fertiliser
- Stringing
- Training





# March: Harvest – field operations





# Harvest – picking machine operations





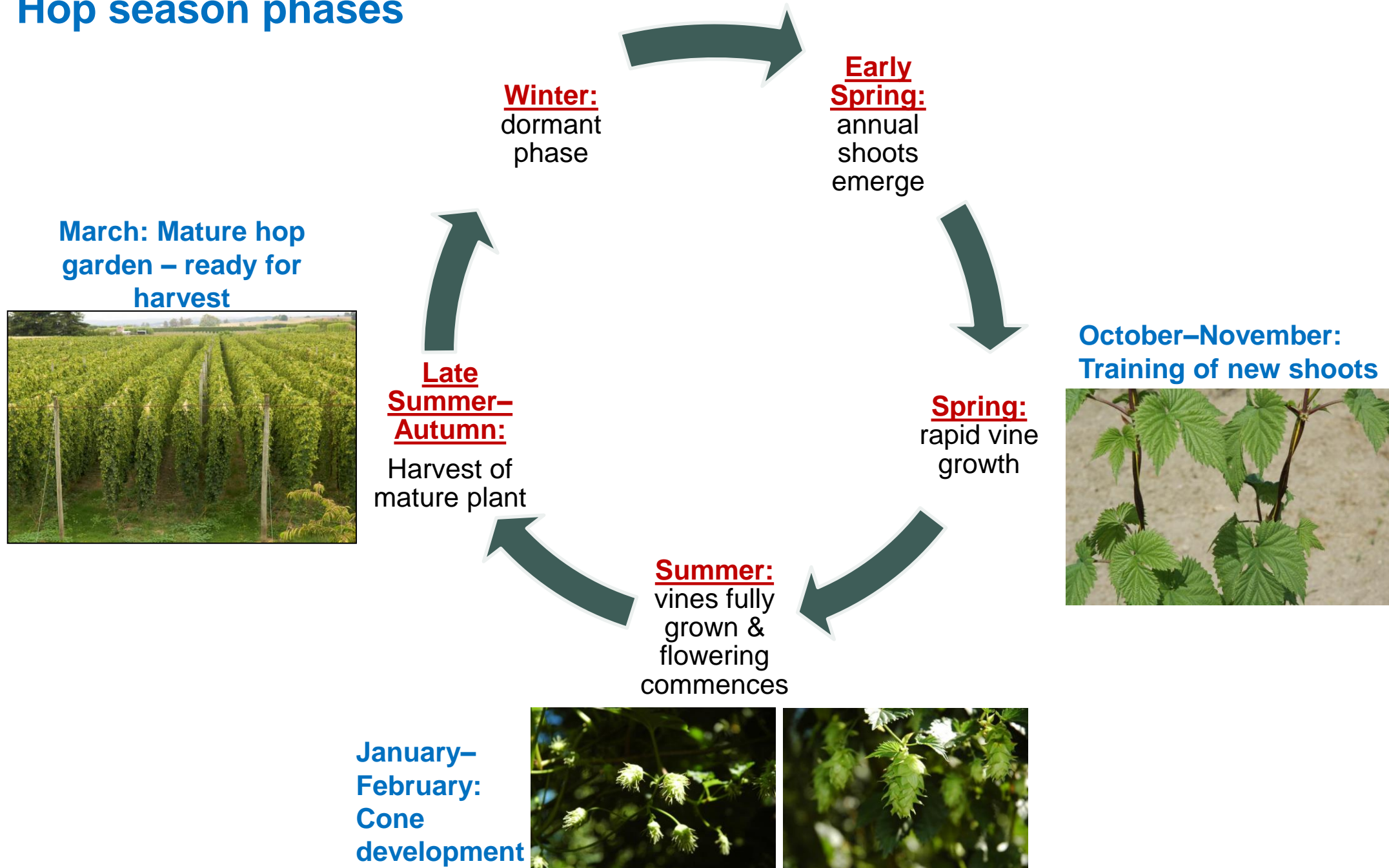
## Kiln drying



## Conditioning floor



# Hop season phases

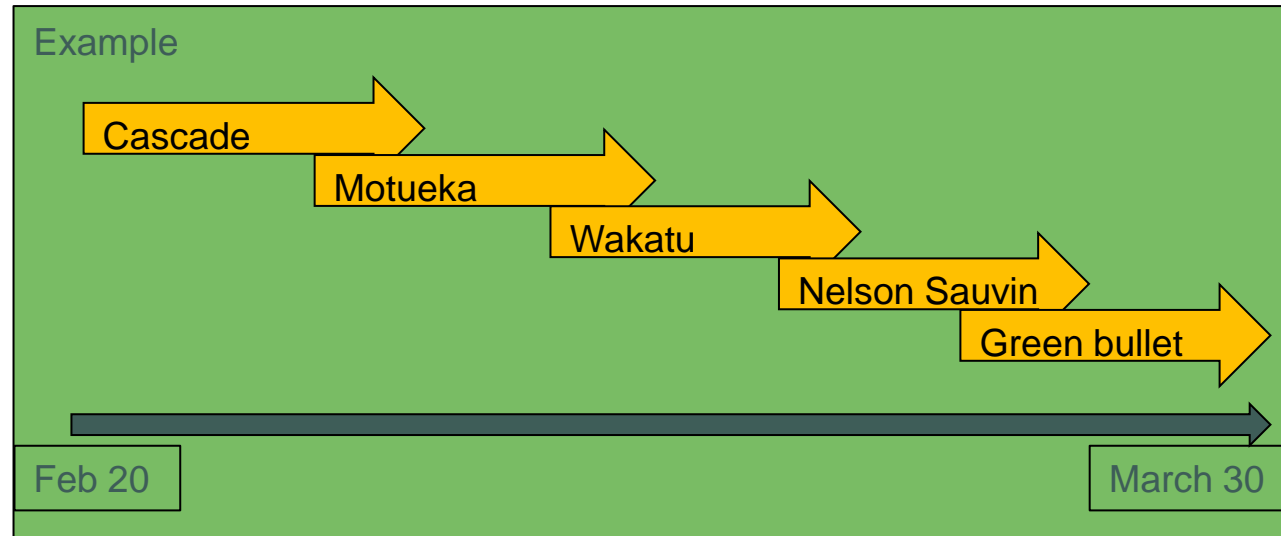




# Important criteria



- Yield
  - A number of agronomic factors can affect this
  - Training time and quality of trained material
  - Fertiliser, irrigation and weed control
- Harvest window
  - Each cultivar has 5–7 days to be harvested, varies by location, soil type, etc.
  - Dry matter and chemical profile used to assess harvest ripeness.

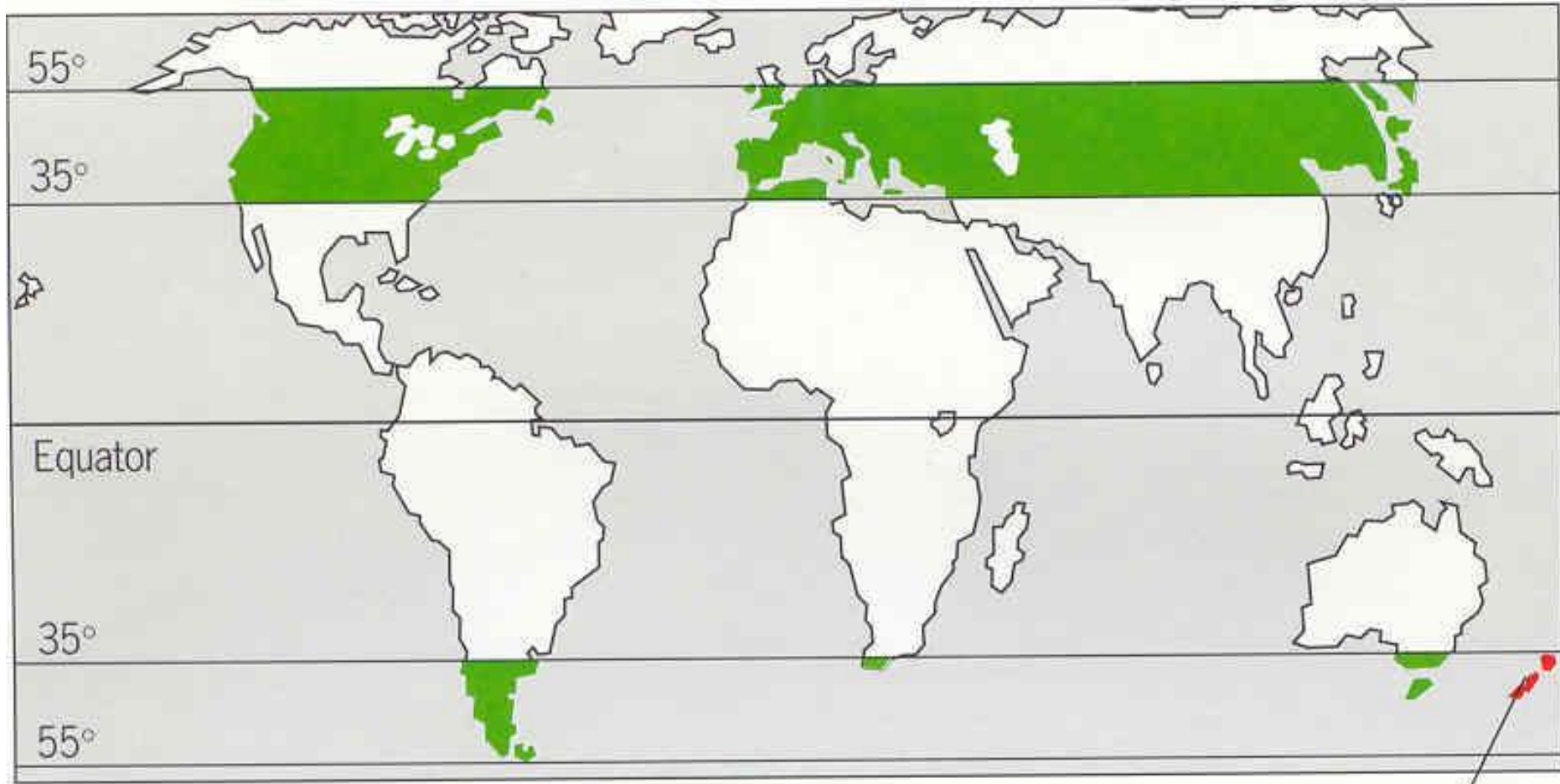


# Limits of hop growing areas



Potential growing  
zone Northern  
Hemisphere

Potential growing  
zone Southern  
Hemisphere



New Zealand



# Hop potential in NZ

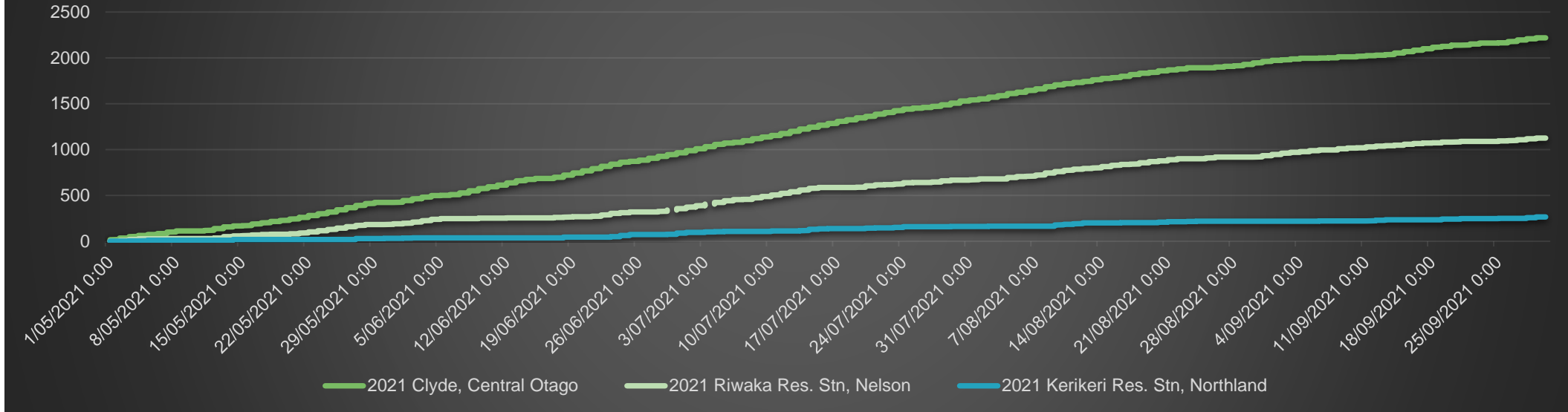


- PFR trial established 2016 to study potential for hop production outside the traditional area at the top of the South Island.
- 3 sites chosen
  - Kerikeri ~35° south
  - Motueka ~41° south
  - Clyde ~45° south
- 10 commercial cultivars chosen covering the range of harvest windows and yields

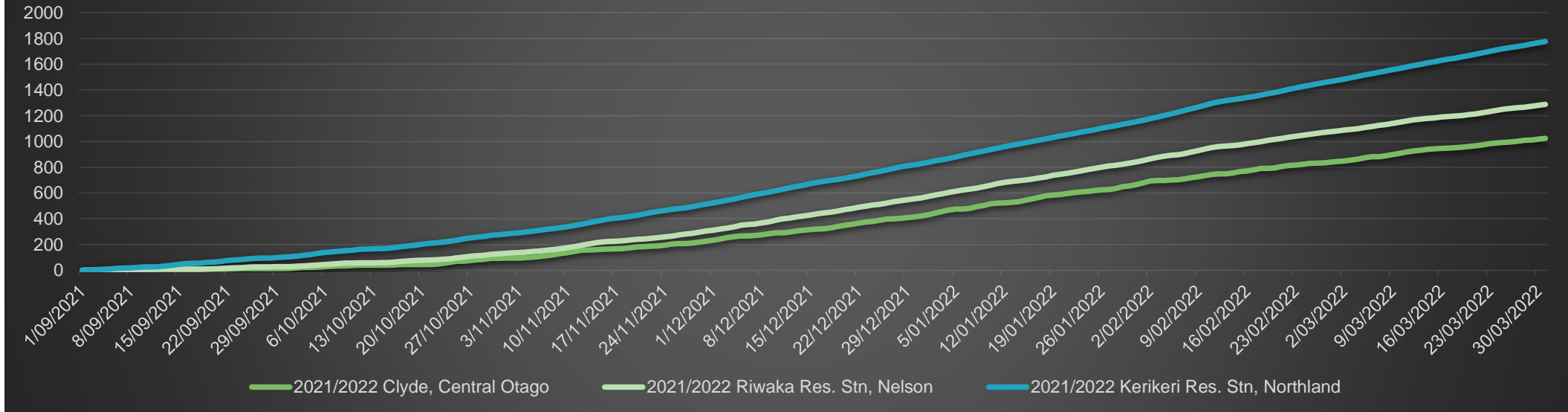




## Chill hours below 7°C



## Growing degree days





# Yield



- Kerikeri had lower yield compared with the other sites
  - Lower winter chilling (no frosts)
- Clyde and Motueka had similar yields
- Challenges
  - Orchard management
  - New to the crop

Clyde Hop garden



Motueka Hop garden



# Harvest windows



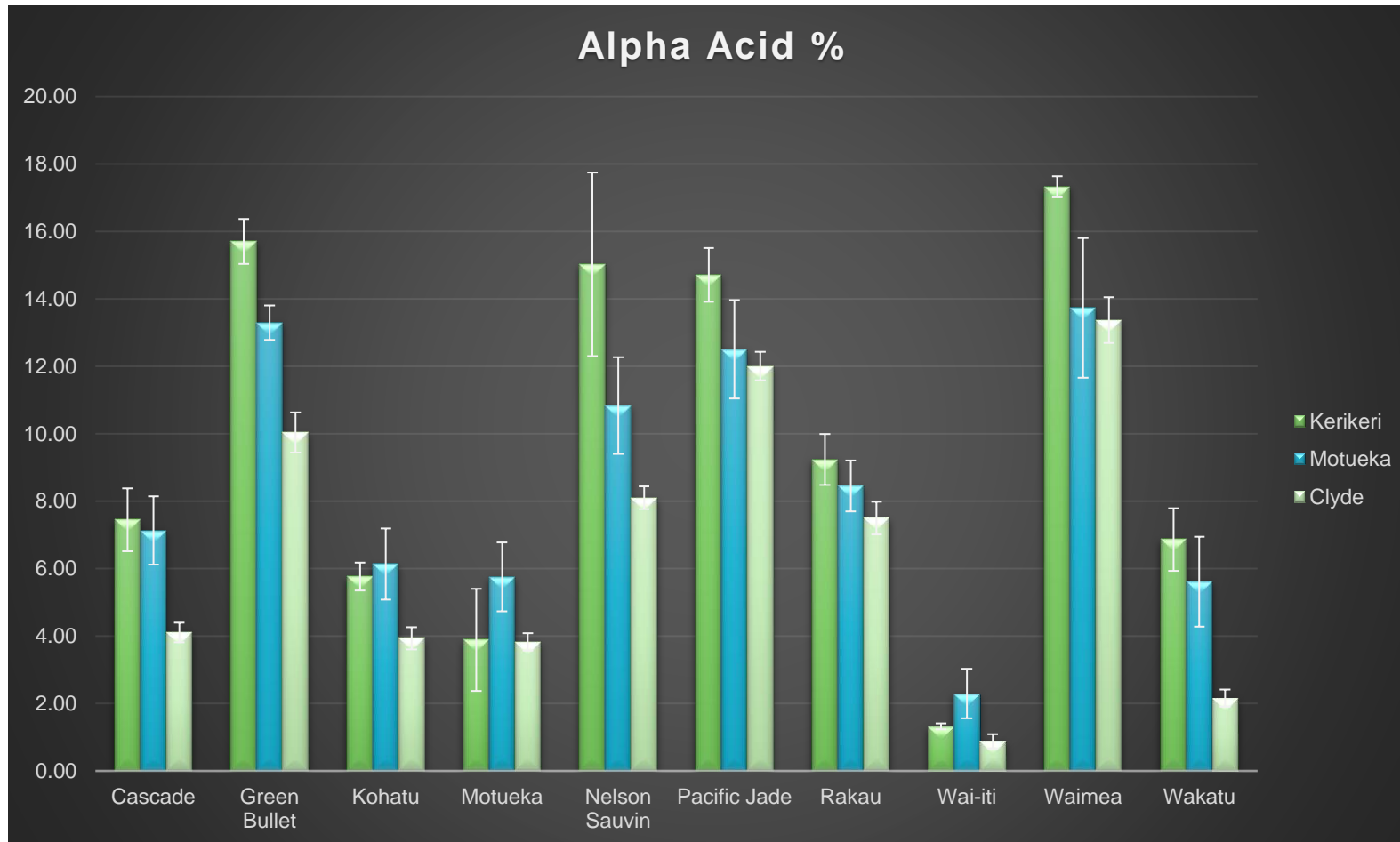
- Motueka and Clyde – Similar harvest dates (other than early cultivars)
- Kerikeri – Harvest dates up to 30 days earlier

	Harvest date Kerikeri*	Harvest date Motueka*	Harvest date Clyde*
Cascade	27-Jan	25-Feb	8-Mar
Motueka™	18-Feb	3-Mar	10-Mar
Wakatu™	12-Feb	5-Mar	11-Mar
Kohatu®	24-Feb	10-Mar	15-Mar
Wai-iti™	3-Mar	14-Mar	18-Mar
Nelson Sauvignon™	17-Feb	20-Mar	17-Mar
Pacific Jade™	4-Feb	20-Mar	23-Mar
Waimea™	12-Feb	22-Mar	24-Mar
Rakau™	26-Feb	24-Mar	30-Mar
Green Bullet™	8-Mar	28-Mar	25-Mar

*\*Dates are indicative only, and vary year to year*



# Chemistry (Alpha Acid)



# To grow hops successfully you need.....

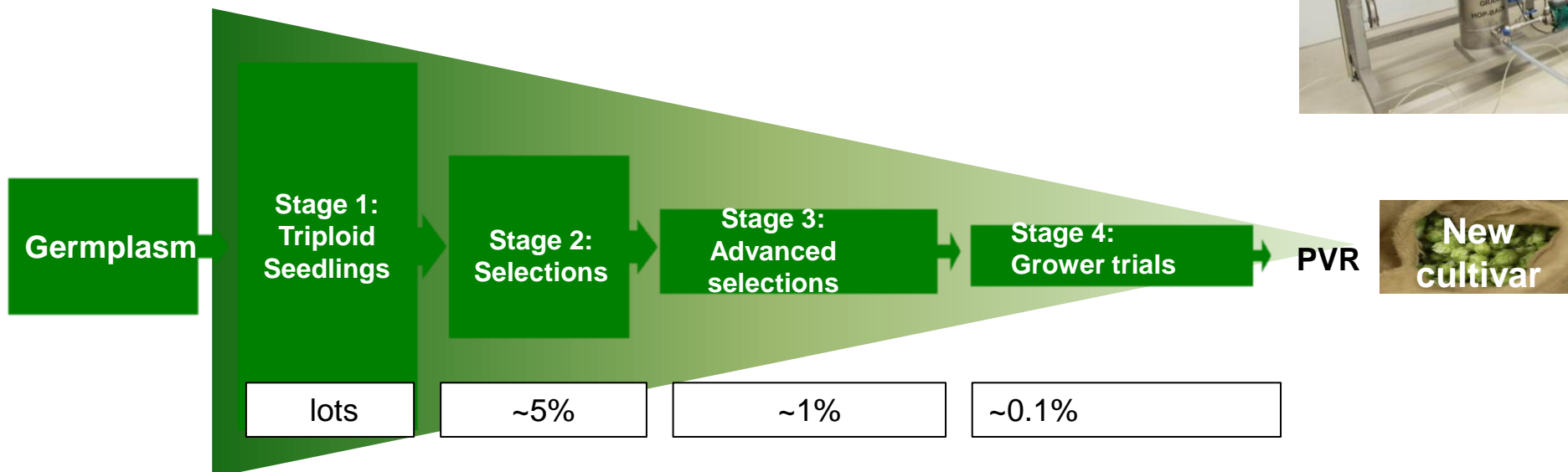


- Good winter chill
- High sunlight hours – late spring to autumn
- Access to water for irrigation
- Little wind – late spring to autumn
- Flat land
- **A good understanding of the crop and its requirements**
- **Facilities to handle post-harvest requirements – Cool store**
- Many resources available online or via books
- Roughly anywhere from Taupō south should be able to grow hops



# Breeding

- Hop use in brewing is like the fashion industry
- Constant demand for unique flavours and aromas
- Breeding is the best way to develop and explore new aromas and flavours
- Yield and harvest window important criteria



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Thank you

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future.  
Together.

# Disclaimer

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