Measuring Baume

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Introduction

- History to measuring baume in grapes
- Why measure sugar levels?
- How sugars develop in vines
- Sampling
- Measuring sugar in field

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Baumé or ºBrix

- Baumé (named after Antoine Baumé), measure of sugar content
- Indicates potential alcohol that may be achieved
- Historically used in Australia

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Baumé or ºBrix

- ºBrix named after Adolf Brix, measure of the concentration of sugar in solution
- Expressed as the % by weight of sugar in solution at a specified temperature
- Scientists and some wineries prefer this term
- 1.8 ºBrix = 1 ºBaume

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Why measure Baumé /ºBrix?

- ºBrix is a measure of sugar and thus gives an indication of potential alcohol levels
- Higher ºBrix levels generally indicate higher potential alcohol levels
- Currently ºBrix is the best readily available indicator to determine when grapes are optimal for winemaking.

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Why measure Baumé /ºBrix?

- Date of harvest can be predicted
- Regular measurements of sugar level during the ripening period can determine time of harvest
- Most wineries have a minimum ºBrix level to be reached before they accept grapes for processing

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Red Grapes Minimum Baume

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Variety	Min Baume
Pinot Noir	10
Red Fronty	14
Ruby Cab	13
Petite Verdot	13
Mataro	13
Merlot	13.5
Cab Sav	13.5
Tyrian	12.5

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How sugars develop in vines

- Sugar is made from the elements C, H and O which makes up carbohydrates
- Photosynthesis produces sugar by the conversion of CO_2 , light and H_20
- Light is required to drive photosynthesis
- Leaves are the primary source for photosynthesis

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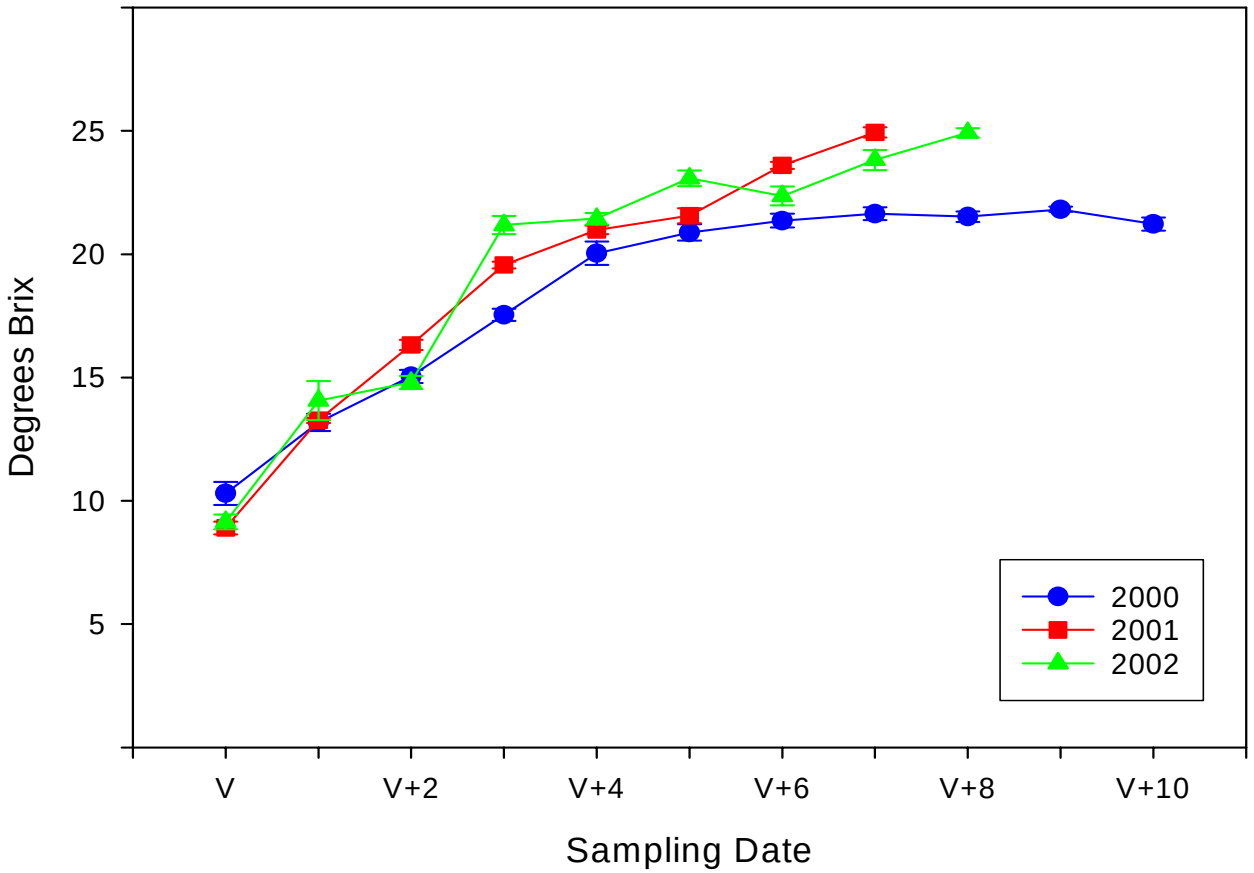
Berry Ripening in the Riverina



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Sampling

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- Need to ensure they are representative
  - Sample size depends on variability of vineyard
  - And also the variability within the vine
- Samples need to be taken at the same time each day
- Examples of methods:
  - 5 bunches out of a transect from 4 vines
  - 40 bunches from each of 40 vines

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Processing sample

- Grapes can be cooled stored
- Crush with out breaking seeds
- Clarify juice
- Process sample immediately
- Juice should not be stored and then measured

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Measuring Sample -Hydrometer

- Hydrometers – measures the specific gravity of a solution
- This relates to the total soluble solids or sugar content
- Sugars represent 90-94% of all total soluble solids
- Also useful to follow the progress of fermentation

Hydrometer - procedure

- Fill cylinder to about 10cms from top
- Rinse hydrometer with a little juice before putting in juice
- Place in cylinder gently and push to bottom
- Move up and down to mix juice
- Spin hydrometer to remove air bubbles

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Hydrometer - procedure

- When settled, read the indicated reading at the bottom of the meniscus
- Insert a thermometer into the juice and read temperature
- Apply temperature correction
- ºBaume hydrometers – for every ºC above or below 20º add or subtract 0.05 ºBaume, respectively

Temperature Correction Example

- Example 1
  - Sample with a Baume reading of 13.5º and a temperature of 22ºC.
  - True reading of 13.6º Baume (13.5 +0.10)

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Example 2

  - Sample with a Baume reading of 12.2 and a temperature of 17ºC.
  - True reading of 12.02ºBaume (12.2-0.18)

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Hydrometer – Source of Errors

- Incorrect reading of hydrometer
  - Reading should be taken at the bottom of the meniscus
- Faulty hydrometer
  - Should be checked against a known sugar solution
- Failure to measure juice temperature
  - No application of temperature correction factor
- Hydrometer not floating freely
  - Due to suspended solids, hydrometer must be floating freely
- Unclean hydrometer
  - Must be free from grease, dirt and detergent residue

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Measuring sample - Refractometer

- Refractometers are instruments designed to measure the refractive index of a solution
- This means to what extent a beam of light is bent when it passes through a solution
- The degree to how far the light is bent depends on the levels of total soluble solids
- Refractometers are calibrated to give the concentration of total soluble solids in ºBrix.

Measuring Procedure – Hand held refractometer

- Open prism box
- Place a drop of juice on the glass surface (make sure it is covered)
- Close prism box
- Hold towards light source
- Read graduated scale, where line intersects two regions (dark & light)
- Most refractometers these days automatically temperature correct.

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Measuring procedure – Bench top refractometer

- Instructions vary depend on the machine bought
- Same principles apply to a bench top as for a hand held
- Usually automatically temperature correct

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Refractometer-Source of Error

- Unclean prism
  - Clean with ethanol (70%)
- Use distilled water to zero instrument

Summary

- Sugar measurement is a tool used to indicate the ripeness of grapes
- The use of Brix or Baume is a personal preference
- It also relates to alcohol in wine
- A few simple techniques allow this parameter to be easily read in the field.