Small berries, better quality.

Berry size – does it matter?

Or.... Is it what’s inside that counts?

Or.... Is it how you change it that matters?
“Berry size is widely recognised as a factor in determining winegrape quality”
Roby et al., 2004
Bring on the questions..........
Searching for the holy grape

“I got it on eBay.”
What is Quality?

“being of good worth, well made, fit for purpose”

How do you define “fit for purpose”? 
Getting from the Vineyard to the Wine is Complex

SOIL & WATER:
- Soil depth
- Structure
- Nutrients
- Soil management
- Irrigation

GENOTYPE:
- Variety
- Rootstock

COMPETITION:
- Pest
- Disease
- Weed management

Macro-climate
- Latitude
- Altitude
- Topography

Meso-climate:
- Temperature
- Wind
- Rain
- Exposure
- Relative Humidity

Vine Growth
- Crop Load

Micro-climate:
- Bunch & leaf exposure
- Temperature

Canopy Management
- Vine spacing
- Training
- Shoot positioning
- Pruning
- Hedging
- Thinning
- Leaf removal

Photosynthesis
- Rate of Maturation

Grape Composition

Grape Composition

Harvesting Decision

Vinification

Aging

WINE QUALITY
Few studies have specifically looked at berry size alone as an indicator of wine quality.

≠ Quality

See Further Reading list for references
How do we change berry size?

- Irrigation/Water Status
- Pruning
- Leaf Thinning and Bunch Thinning
- Exposure/Temperature

Vine measures and vine balance

Treatment effects → Berry weight → Berry composition

Berry weight → Berry anatomy → Berry physiology

Wine quality → Wine composition

Wine quality → Wine composition

Berry physiology
Irrigation/Water Status

May effect:

- Berry weight, which may be linked to wine quality scores (or not)
- Berry composition
  - can be linked to changes in berry physiology and anatomy
- A range of vine measures

Separating the effects of irrigation and natural berry size:
  Irrigation effects > berry weight variation

Vintage effects may be greater than treatment effects

See Further Reading list for references
What does this mean for quality?

Pruning

May affect:

- Berry weight
- Berry composition – increased concentrations of berry phenolics
- Wine composition – but not in the same way as berry composition
- **Wine quality scores - or not!**
- A range of vine measures

Vintage effects may be greater than treatment effects

See Further Reading list for references
What does this mean for quality?

Leaf Thinning and Bunch Thinning

May effect:

- Berry weight
- Berry composition, although may be related to skin mass, not berry size
- **Wine quality scores** – but may not be related to berry size changes
- A range of vine measures

See Further Reading list for references
What does this mean for quality?

Exposure/Temperature

May effect:

• Berry weight, but not skin weight per berry.

• Berry composition

• Changed sensory attributes from smaller berries, or reduced quality, but berry weight not reported

• A range of vine measures

See Further Reading list for references
What does this mean for quality?

Vineyard assessment of grape quality

- Uses a range of indicators including
  - vine parameters
  - berry parameters (including berry weight)
  - juice composition

- Can be used in conjunction with berry grading and payment data to determine whether assessment is successful in predicting quality

- Variable results according to region, variety, starting ‘quality’ of grapes

See Further Reading list for references
How do we summarise all this?

- Berry weight can be altered.
- Berry composition is usually altered.
- Berry anatomy may be altered.
- Vine measures may be altered.
- Wine composition may be altered.

BUT

The relationship to quality is not consistent.

AND

Often, contrary to the myth, smaller berries produced the lowest quality wines.
Why isn’t it a simple relationship?

 berry composition

 Vine stress

 Vine balance

 ≠/≠
So What?????

★ Is any change in berry composition reflected in a change in wine composition?

★ How would you produce smaller berries – would it be by improving vine balance?

What makes your grapes “of good worth, well made, fit for purpose”? 
Ask not what your grape can do for you, ask what you can do for your grape
The Australian Wine Research Institute, a member of the Wine Innovation Cluster in Adelaide, is supported by Australian grapegrowers and winemakers through their investment body, the Grape and Wine Research and Development Corporation, with matching funds from the Australian Government.
Questions?

Comments?
Further Reading

Bindon et al., 2008. SAfJEV*. 29, 71-78
Bravdo et al., 1985. AJEV*, 36, 125-131
Bravdo et al., 1985. AJEV, 36, 132-139
Bravdo et al., 1984. AJEV, 34, 247-252
Chapman et al., 2004. AJEV, 55, 325-334
Chapman et al., 2005. AJGWR*, 11, 339-347
Harbertson et al., 2002. AJEV, 53, 54-59
Hazak et al., 2005. Acta Horticulturae, 689, 189-196
Hepner et al., 1985. AJEV 36, 77-85
Holt et al., 2008. AJGWR 14, 191-202
Holt et al., 2008. AJGWR 14, 162-176
Hunter et al., 1991. AJEV 42, 13-18
Hunter et al., 1995. AJEV 46, 306-314
Kasimatsis, et al., 1985. AJEV, 36, 240-244.
Kassara and Kennedy, 2011. JAFC, 59, 8409-8412
Kliwer & Dokoozian, 2005. AJEV, 56, 170-171
Koundouris et al., 2006, JAFC, 54, 5077-5086
McCarthy 1997. AJGWR, 3, 101-108
Matthews and Anderson, 1988. AJEV,39, 313-320
Ojeda et al., 2002. AJEV, 54, 261-267
Ojeda et al. 2001. Vitis, 40(3), 141-145
Ough & Nagaoka, 1984. AJEV, 35, 30-34
Poni et al., 2009. AJGWR, 15, 185-193
Ristic et al., 2007. AJGWR, 13, 53-65
Roby & Matthews, 2004. AJGWR, 10, 74-82
Roby et al. 2004. AJGWR, 10, 100-107
Walker et al., 2005. AJGWR, 11, 2-8
Winter et al., 2007. Aust. Viti.

- SAfJEV – South African Journal of Enology and Viticulture
- AJEV – American Journal of Enology and Viticulture
- AJGWR - Australian Journal of Grape and Wine Research
- JAFC – Journal of Agricultural and Food Chemistry
- Aust Viti. – Australian Viticulture
What is Quality?

From Wikipedia.....

“the non-inferiority or superiority of something”

“an attribute or a property”

“level of excellence”

“the degree to which a man-made object or system is free from bugs and flaws, as opposed to scope of functions or quantity of items”
Give us the grape until harvest and we’ll give you the wine

Gazing into the crystal grape

Well may we say God save the grape because nothing can save the winemaker*

A grape in the lab is worth two on the vine

Seize the grape
Searching for the holy grape

“A cask of wine works more miracles than a church full of saints” (Italian proverb)