Global Wine Industry

the canary in the climate change coalmine

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Grape Vintages are strongly influenced by Climate Change

Globally vintages are moving forward in most regions globally under climate change
Some Australian regions have moved forward by 1.6 days per year over past 25 years
Why Climate Important to Good Wine
Varietal Expression necessary for quality wine

Varietal-Climate Thresholds

- **Too Cold Threshold**: Lower sugar levels, Unripe flavors, Unbalanced
- **Too Warm Threshold**: Lower retention of acids, Overripe flavors, Unbalanced
- **Optimum Zone**: Consistent sugar levels, Ripe flavors, Generally balanced - Vintage variations driven by seasonal climate factors (frost, untimely rain, etc.)

Plasticity – Adaptation Management (short-term) Varietal (long-term)

Climate Metrics
Growing Season Average Temperatures, Heat Accumulation or Drought Stress Metrics
Climate Change and the Global Wine industry

“Climate change is the new reality for the French wine industry.”

Bernard Angelras
Chairman of the French Institute of Vine and Wine

Where grape varieties are legislated in appellations (GI regions) as in France there are large financial implications.
Impacts of Climate Change in Grape Maturity
Grapes don’t lie

**Grape Quality**
Altered Composition

**Vintage Compression**
2016 Weekly Grape Intake vs. 02-15 Vintage Average

**Alcohol Content**
Higher

(Webb, Whetton, Barlow 2007)
Long term data sets

For this assessment vintage records from 40 vineyard blocks in 11 winegrape growing regions from Southern Australia have been accessed.

Winegrowing sites (12 sites) in 11 regions (grey) in south–east Australia from where data was accessed (stars: blue >25yrs, red <20yrs).

Data extend back from 2009 for at least 25 yrs (ave~51yrs) for 8 of the blocks and for 32 blocks an avg~17yrs.
Rate of change in Maturity increases with time

**Average rate of Advance**
- 1985-2009: 0.8 days/yr
- 1993-2009: 1.7 days/yr

Webb, Whetton and Barlow (2011)
Some timely advice from Charles

“It is not the strongest of the species that survives, nor the most intelligent that survives.”

“It is the one that is the most adaptable to change.”
Adaptation for Granite Belt Wine Region

Potential strategies (not mutually exclusive)

- Efficient irrigation – supply, delivery, management
- Canopy management
- Row orientation
- Alternative varieties – already have a wide diversity of varieties grown and evaluated
- Evolving wine styles
- Move to higher elevations (perhaps and option here)
2016 Weekly Grape Intake compare 2002 to 2015 Vintage Average

Week Beginning

Tonnes
Climate Change Adaptation

*a risk management framework*

- **Exposure**
  - climate change

- **Sensitivity**
  - To these new climates

- **Potential impacts**

- **Adaptive capacity**

**Vulnerability**