

The tannin story – how do we get near Burgundy?

Bob Dambergs Pinot Noir Symposium 4 July 2019





Some of the great wines of the world are made with Pinot Noir, but.....

- Climate specific
- Shoots early then grows slowly, so it's a frost risk
- Poor fruit set
- Thin skinned
- Susceptible to downy mildew, powdery mildew, botrytis, viruses
- Needs exposure for colour, but burns easily
- Low anthocyanin concentrations and anthocyanins are unstable
- Grapes have high tannin but it is mostly seed tannin
- Wines have relatively low tannin and colour

Why are tannins important?



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Tannins control

- Browning
- Colour stability
- Astringency
- Mouth-feel
- Bitterness
- Protection against oxidation
- Quality



Understanding grape and wine tannins

Grape tannins

•colourless polymeric phenolic compounds in skin, seeds and stalks
•precipitate proteins ⇒ astringent

Red wine tannins

grape tannins (~30%) & modified tannins (~70%)
plus oak-derived hydrolysable tannins & oenotannins

•Include pigmented tannins (pigmented polymers)





Anthocyanin and pigmented tannins



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Winemaking and Aging

Tannin and Anthocyanins react



Anthocyanins

- Colour in grapes and young wine
- Unstable
- Bleached by SO₂
- Do not last long in wine

Pigmented polymers

- Colour in wine
- Reaction products of tannin and anthocyanin
- Important for long-term colour stability
- Resistant to SO₂ bleaching

The problem with Pinot



- Low total anthocyanins
- No acylated or coumarylated anthocyanins
- Grapes have high tannin but it's mostly seed tannin
- Wines have relatively low tannin and colour



The source of tannin influences colour stability







Tannin correlates with commercial wine quality





Oregon Pinot: tannin and pigment correlate with \$quality\$





A tongue in cheek look at the value of tannin



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\$29.50

Tannin **1.31 g/L** Pigmented tannin 1.14 AU



\$46

Tannin 1.84 g/L Pigmented tannin 1.56 AU

Tannin, pigment and quality: wineshow performance





Tasmanian Wineshow

Best wines have an ideal combination of tannin and pigment

Tannin and pigment analysis correlate with wine sensory





Optimising phenolic development during red wine maceration



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Need to synchronise

- extraction of anthocyanin
- extraction of tannin (skin, seeds and stems?)
- availability of active yeast metabolites
- promotion of anthocyanin/tannin reactions to form stable pigments







- Crushing
 - destemming, whole bunches, whole berries
- Preferment maceration
 - cold soak, enzyme, heating
- >Co-fermentation with skins, other varieties
- Juice runoff
- Yeast type
 - grape aroma release, fermentation esters, mouthfeel, colour/tannin stabilisation
- > Cap management, temperature, fermentation time
- Seed removal or addition
- Post ferment maceration
- Malolactic ferment
- ≻ Oak





Pinot grape anthocyanin and tannin vary with clone



Pressing Matters vineyard, Southern Tasmania







Not equivalent to tannin !!







Delayed (wild) malolactic fermentation stabilises colour



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When samples are marked by treatment the shift is in a similar direction for all wineries. A= Indigenous B= Inoculated Indigenous MLF resulted in wines with higher colour density, higher pigmented tannin and a higher % stabilised pigment

Indigenous MLF resulted in wines with lower hue (more purple) and lower free anthocyanins



Not for the faint hearted



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Hot maceration

Rapid extraction of tannin and anthocyanins

Cool fermentation

Preserve fermentation volatiles

>Less cap work required

Heat & microwave maceration







Yeast strain influences wine tannin





Small scale commercial maceration trials



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RC 212 control EC1118 Bayanus: AWRI 1176, AWRI 1375 Hybrids: AWRI Fusion, AWRI 1503 TD+ 1118 Carbonic maceration White skins Cold soak, then wild ferment Cold soak, then wild ferment Cold soak, wild primary, delayed wild malo Co-fermentation with Pinot Gris or GT Stalks Transfusion (run off juice and return near end of ferment)

ICCS Workshop 2-"Taming the Pinot noir terroir" with Nick Glaetzer and Jenny Bellon



Controlling tannin





Controlling pigmented tannin





Ratio of pigmented tannin and total tannin





Fixing the problem with Pinot



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Acknowledgments



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Industry collaborators



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