



Centre for Expertise in Smoke Taint Research

Dr Mark Downey, Director

Overview

- Background
- Current knowledge
- Knowledge gaps
- Centre for Expertise in Smoke Taint Research
- Aims & Objectives

Fire in the landscape

- Co-evolution of ecosystems with fire
 - Germination
 - Establishment
 - Reproduction
 - Nutrient cycling
 - Biodiversity
- Fire ecology



Destructive force

- Australia's deadliest bushfires
 - Black Saturday 2009 Victoria
 - Ash Wednesday 1983 South Australia
 - Black Friday 1939 Victoria
 - Black Tuesday 1967 Tasmania
 - Black Sunday 1926 Victoria





Impact on viticulture

- Awareness raised
 - 2003 Alpine Fires in Victoria
 - WA fires in 2003 and 2004
- Large scale viticulture relatively recent
 - Tobacco in NE Vic.
 - Apples in Mt Barker, WA
 - Forestry & dairy in Margaret River

Impact on viticulture

- A lot of work done by AWRI
 - Analytical methods for routine analysis
- Previous research from other industries
 - Smoke composition research, human health
 - Food technology, eg. smoked meats
- DAFWA
 - Field trials, sensitivity during development
- 2006 bushfires cost Victorian producers \$100 million



What is smoke taint?



- Smoke taint descriptors are many and varied
 - smoky, woody, leather, coffee, chocolate, truffle
- A little bit adds complexity
- But too much
 - smoked salmon, salami, bacon, smoky bacon, roast meat, gamey, earthy, burnt toast, cigar box, cigarette, ash, cold ash, charcoal, ashtray, tar, bitter, acrid

What is smoke taint?



- 2 key markers:
 - guaiacol & 4-methyl guaiacol
- Other compounds include:
 - 4-ethylguaiacol, 4-propylguaiacol, 4-vinyl guaiacol, vanillin, eugenol, isoeugenol, phenol, 4-ethylphenol, 2,4-dimethylphenol, 4-propylphenol, cineole, o-cresol, syringol, methylsyringol, syringaldehyde
- Dose response

What is smoke taint?

- Some varieties produce these compounds naturally
- Aging in oak barrels
 - Toasted barrels
 - Staves, chips, some tannin additives
- Higher in smoke exposed grapes
- Higher in wines made from smoked grapes



What is smoke taint?

- Increases in wine over time
- Free compounds are volatile
- Bound compounds
 - Non-volatile
 - Attached to a sugar, eg. glucose
 - Sugar is cleaved off during winemaking and aging



What don't we know

- How smoke taint compounds get into the grapes
- How to stop smoke compounds getting into grapes
- How to stop smoke compounds getting into wine
- What to do after it gets in
- How much smoke is enough (or too much)

Centre for Expertise in Smoke Taint Research

- Election commitment by Minister Peter Walsh
- \$4 Million over 4 years (2011 - 2015)
- Announced May 2011
- Formally launched May 2012



Centre for Expertise in Smoke Taint Research

- Virtual Centre based in Mildura
 - Supported by a recently opened experimental winery
- Major collaborators:
 - AWRI
 - DAFWA
 - Curtin University
 - University of Adelaide



Centre for Expertise in Smoke Taint Research

Staff

Mildura

- Dr Mark Downey, Director
- Dr Nicole Cain, Research Scientist
- Mr Peter Rogers, Experimental Winemaker
- Mr Fred Hancock, Senior Viticultural Technical Officer
- Mr Joel Beloy, Laboratory Technician

Melbourne

- Dr Craige Trenerry, Senior Research Scientist
- Dr David Allen, Senior Analytical Chemist
- Mr Tim Plozza, Analytical Chemist
- Ms Kristen Pitt, Project Support Officer
- Mr Subhash Sharma, Spatial Information Scientist

Rutherglen

- Mr Ricky James, Extension Specialist

Centre for Expertise in Smoke Taint Research

Objectives

- Increase understanding of how smoke affects wine composition by:
 - Identifying smoke taint compounds and their mode of entry
 - Identifying the impact of different fuel types
 - Determining the relative impacts of controlled burning
 - Predicting the shelf-life of exposed wines

Centre for Expertise in Smoke Taint Research

Objectives

- Explore strategies to reduce uptake of smoke
- Measure and manage risk
- Facilitate evidence based communication between industry and fire & land managers



Outcomes

- Remove the fear and uncertainty
- Tools to measure & manage risk
- Dialogue and decision-making informed by science
- A viable wine sector in bushfire prone regions

Questions?