

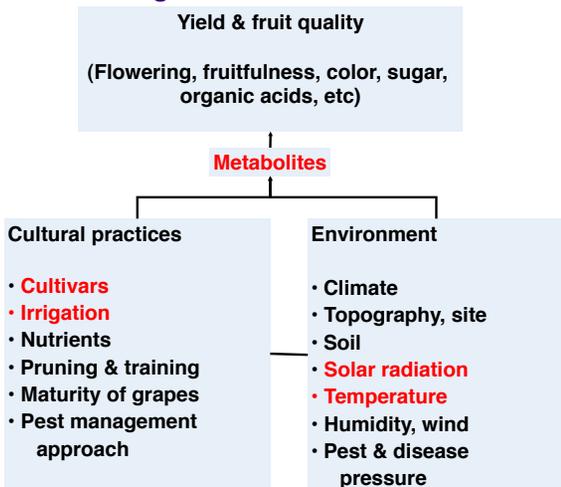
# Vineyard Management Practices and the Quality of Grapes and Grape Products

Horticultural Crops Research Unit (Corvallis, OR; Prosser, WA; Parma, ID)

Principle Scientists: Jungmin Lee, Krista Shellie, and Julie Tarara (Lead Scientist)



## Our overall goal



### Jungmin's approach:

- Correlation between methods
- Phenolic compounds
- Simple sugars, organic acids, free amino acids, etc.

### Krista's approach:

- Yield components, fruit maturity indices, leaf water potential, etc.

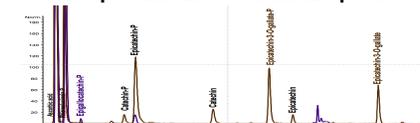
### Julie's approach:

- Continuous measurements of microclimate— temperature, solar radiation, humidity, etc.

## Current questions...

- How does solar radiation impact metabolite accumulation and profile?
- What growth stages are most affected by temperature and how do alterations change grape quality compounds?
- What is the optimum temperature range for grape metabolite accumulation?

## Grape skin and seed tannin profiles



Control clusters



Cooled clusters



Heated clusters



## Grape fractionation



## Influence of berry skin temperature on Merlot anthocyanins

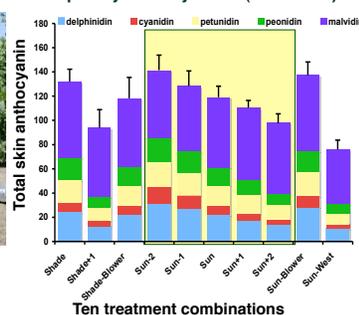
Collaboration with Carolyn Scagel (USDA-ARS) and Sara Spayd (NCSU)



### In-field heating and cooling



Grouped by anthocyanidin (3 seasons)



- Awarded ASEV 2009 best paper in viticulture

- Combination of low light and high berry temperature decreased total skin anthocyanin.
- Exposure to high temperature extremes appears to alter partitioning of anthocyanins between acylated & non-acylated forms, and between dihydroxylated & trihydroxylated branches of anthocyanin biosynthetic pathway.

## Deficit irrigation and cultural practices



### Water deficit in Merlot: during berry development

- Increased percentage seed to berry weight up to 27%
- Altered wine volatile aroma composition (terpene alcohols, norisoprenoids) & sensory attributes (dried fruit flavor, canned vegetal aroma).

### Foliar applied, reflectant kaolin particle film:

- increased vine water use efficiency only when soil moisture is non-limiting
- response varied by cultivar
- did not prevent berry surface browning under water deficit
- interacted with irrigation amount on wine sensory attributes