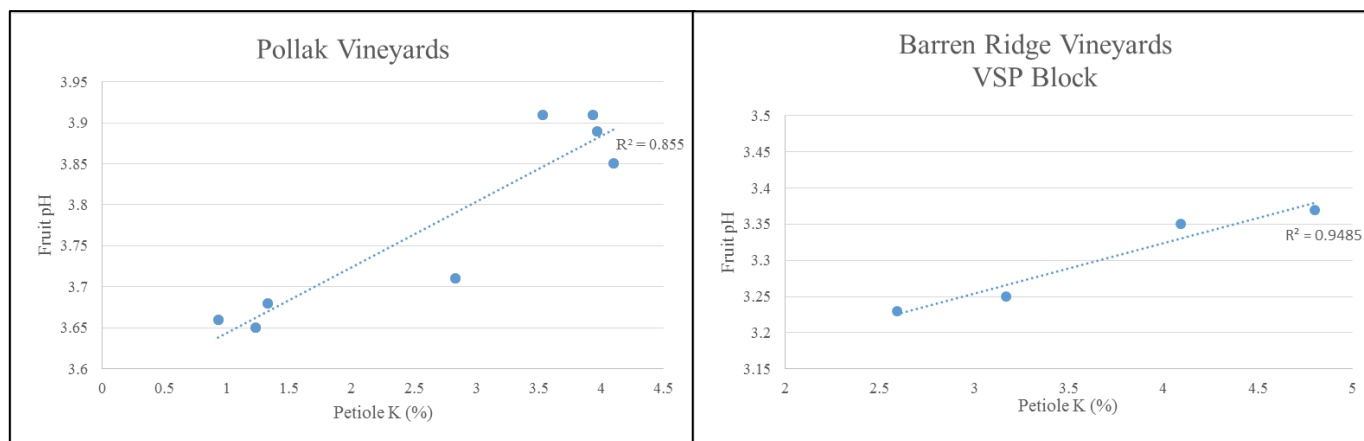
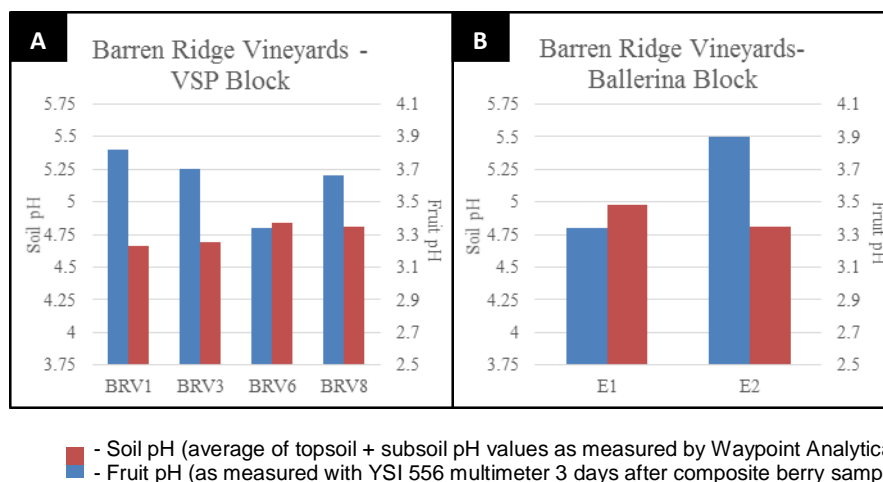


respectively), suggesting that plant tissue K has a major influence on fruit pH at these sites (**Plot 1**). Our third site, Adventure Farm, contains too many confounding viticultural variables (namely vine age and disease) for this relationship to be well studied at this time.



Plot 1: Plots showing a strong positive correlation between bloom petiole K (% reported by Waypoint Analytical Laboratories from composite bloom petiole sample) and fruit pH (as measured with a YSI 556 multimeter 3 days after composite berry sample collection) at Pollak and Barren Ridge Vineyards.

Our preliminary results shown in **Plot 2** suggest a relationship between soil pH and fruit pH – even within a very narrow soil pH range. We observed a strong negative correlation between soil pH and fruit/wine pH in both blocks at Barren Ridge Vineyards, the only study site without a history of intense soil fertilization.



Plot 2: Bar graphs based on preliminary results illustrate the relationship between soil pH and fruit pH for sample locations within the Barren Ridge study areas. Note sample locations with higher soil pH levels have lower associated fruit pH levels, and vice versa, consistently across both the VSP and Ballerina blocks at Barren Ridge Vineyards (A&B).

In a concurrent differential harvest experiment with winemaker Tim Jordan at Barren Ridge Vineyards, we are exploring fruit ripeness and resulting wine quality as a function of soil pH, rock content, and K status. We used soil EC maps to identify homogenous picking zones (high EC and low EC) in both the VSP and Ballerina Petit Verdot blocks (**Figure 1**).

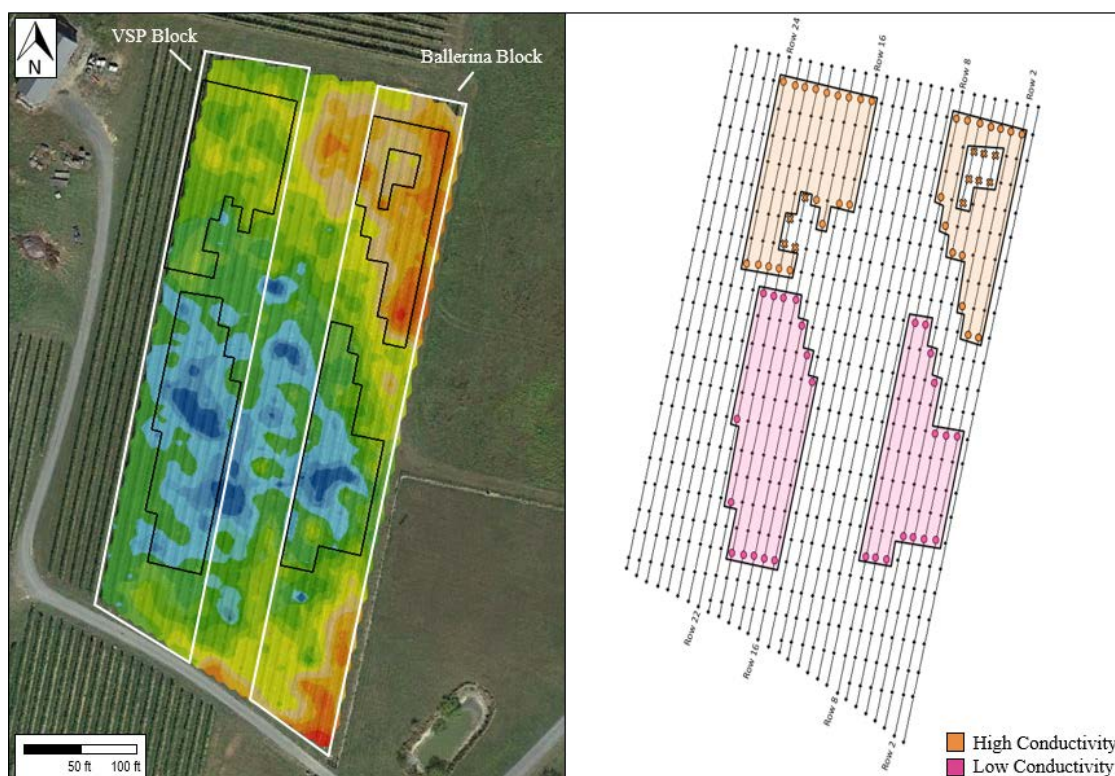


Figure 1: Harvest zones at Barren Ridge Vineyards determined using soil EC mapping and laid out in the field using differential GPS technology. Homogenous high and low conductivity zones were delineated in both the VSP and Ballerina Blocks.

All fruit within each zone was picked and vinified separately with identical winemaking protocols. Harvest parameters (cluster weight, berry weight, yield, foliar surface:fruit weight ratio) and Brix, pH, and titratable acidity were measured. Two lots (Ballerina, VSP) each with two treatments (high soil EC, low soil EC) were vinified through malolactic fermentation and a single free-run barrel of each treatment was produced.

Preliminary results (summarized in Table 1) suggest lower harvest pH in the High EC zones with higher rock content, and higher soil pH. Berry K appears to correspond to the different soil zones as well, though more data points within each zone are needed for a statistically robust analysis.

Soil Zone:	Ballerina Block		VSP Block	
	High EC	Low EC	High EC	Low EC
pH	3.23	3.30	3.12	3.28
°Brix	23.9	24.7	23.3	22.9
Avg. Berry K	2,140 ppm	2,400 ppm	2,160 ppm	2,485 ppm

Table 1: Preliminary results for experimental wines at the BRV research site. Each canopy treatment contains two unique soil zones, harvested separately.

Significant Outreach Activities:

- December 2017: “Update on Soil pH, Potassium and Fruit Properties” Folioes 2017 – Technical meeting of numerous leading growers in the Mid-Atlantic (Bubba Beasley, Charlottesville, VA)
- March 2018: “Mapping Soil, Geology, and Landscape on the Vineyard Scale” Presentation at the Eastern Winery Exposition (Bubba Beasley; Lancaster, PA) – included a section dedicated to this research
- Fall 2018: Discussing with Cain Hickey, Viticulture Extension Specialist at UGA, planning a soil workshop for Georgia winegrowers to share the results of this research with a broad producer audience across the southeast. (Bubba Beasley; Athens, GA)

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