

Food & Water Tailgate (April 27, 2016)

Analyzing vine tissue and estimating vine water loss are key components to delivering fertilizers and irrigation water effectively and efficiently.

Dan Rodrigues, *Owner, VinaQuest LLC*, concluded his three-part series on vine nutrition by talking about tissue sampling.

Key points:

- Visual assessment of vines during the growing season is crucial for monitoring vine nutritional status.
- Current and historical bloom time petiole analysis is critical for planning fertilizer applications in the future.
- Soil analysis and tissue analysis should be compared before treating deficiencies.
- Petiole samples should be taken at 50%-100% bloom and consist of 100-120 petioles.
- Label sample bags clearly with vineyard name, block number, date, and percentage of bloom.
- Use soil analysis, tissue analysis, and nitrogen budgeting to plan fertilizer applications for the next season, but also to confirm the impacts of those fertilizer applications.

Craig Macmillan, *Technical Program Manager, Vineyard Team*, presented the results from the first year of a two year experiment studying the effects of cover crop types and the timing of terminating cover crops on soil moisture.

Key points:

- This project consists of two experiments. One compares the effects of five different types of cover crops on soil moisture. The other compares the effects of different methods and timings of terminating a grass cover crop on soil moisture.
- Results from the first year of the project found no difference in soil moisture between any of the cover crop types or between any of the methods and timings of terminating the grass cover crop.
- Extremely low rainfall during the winter of 2014-2015 may have affected the outcomes.
- Data collection for the second year of the project is under way and analysis will be complete later this summer.

Craig Macmillan, *Technical Program Manager, Vineyard Team*, provided an overview of methods and technologies for estimating reference evapotranspiration (ET_0), crop coefficients (K_c), and vine water use (ET_c).

Key points:

- There are many services which provide estimates of evapotranspiration. Some of them are free.
- The crop coefficient for grapes changes over the growing season and is based on the amount of shade cast by the canopy at solar noon.
- Irrigations can be scheduled to best meet the needs of the plant if one knows the ET_c for the previous week.

Tom Shapland, *co-founder, Tule Technologies*, described Tule Technologies' device and service for measuring actual ET.

Key points:

- The Surface Renewal Method can measure the actual water loss of a relatively large area.
- ET readings during the winter and recording rainfall make an accurate water budget possible.

- Irrigation deficits can be fine-tuned for things like control of canopy size.
- Crop coefficient-based methods for estimating vine water use cannot take vine stress into account.
- The interaction between canopy size, vine stress, wind, fog, etc. lead to errors in vine water use estimates.
- As more Tule sensors go into vineyards, the quality of the data, reports, and recommendations will improve.

The slide shows from the talks can be found here:

- [Grapevine Tissue Analysis \(Dan Rodrigues\)](#)
- [Western SARE Cover Crop Experiment \(Craig Macmillan\)](#)
- [Estimating Vine Water Use \(Craig Macmillan\)](#)
- [Measuring Irrigation with Actual ET \(Tom Shapland\)](#)