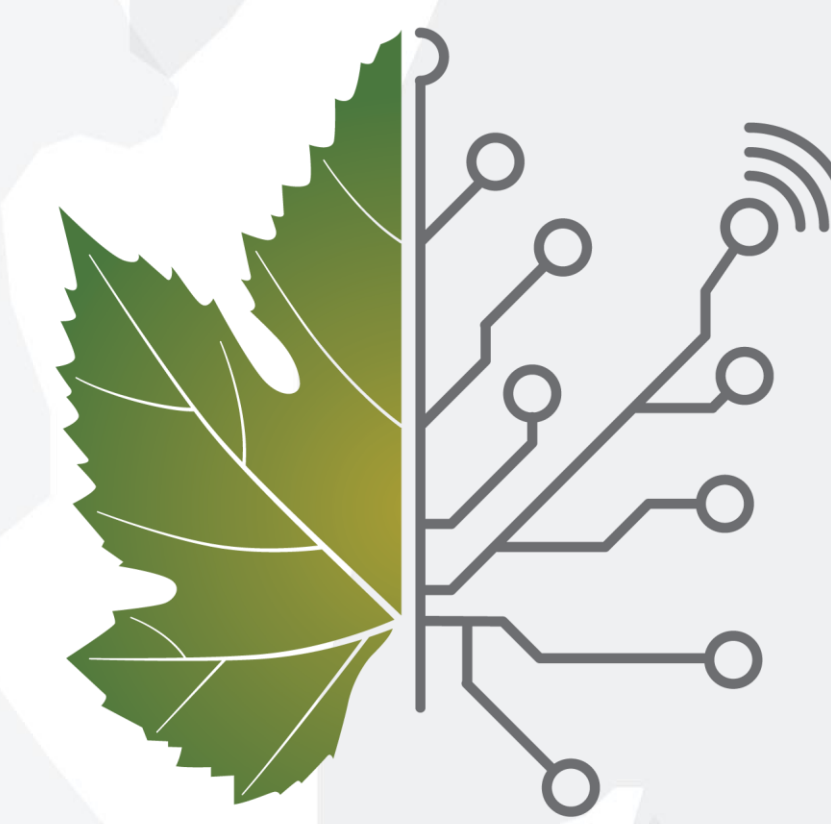


High-Resolution Vineyard Nutrient Management: Project Highlights



HiRes Vineyard NUTRITION

Nataliya Shcherbatyuk¹, Patty Skinkis², Terry Bates³, Manoj Karkee¹, Paul Schreiner⁴ and Markus Keller¹

¹Washington State University ²Oregon State University ³Cornell University ⁴USDA-ARS-HCPGIRU



Background: Vineyard nutrition management is essential for achieving production-specific fruit quality goals. However, test results from standard tissue (leaf and petiole) samples lack standardization in nutrient recommendations across regions and fail to provide spatial resolution across vineyards. Results of this project will enable grape growers to make data-driven nutrient-management decisions for spatially heterogeneous vineyards across the various grape production markets (wine, juice, table and raisin). Our team integrates research and extension investigators from multiple disciplines and institutions pursuing four integrated objectives:

1. Develop non-destructive tools to measure grapevine nutrient status

Differences in leaf nutrient levels alter spectral characteristics outside of the visible range, even before deficiency symptoms become apparent to growers. Optical sensors are being developed to quantify grapevine nutrient status in-field over the growing season.

Sensors & Engineering Team: Manoj Karkee, Jan van Aardt, Alireza Pourreza



Nina Raqueno



Atif Bilal Asad, WSU



Alireza Pourreza, UC Davis

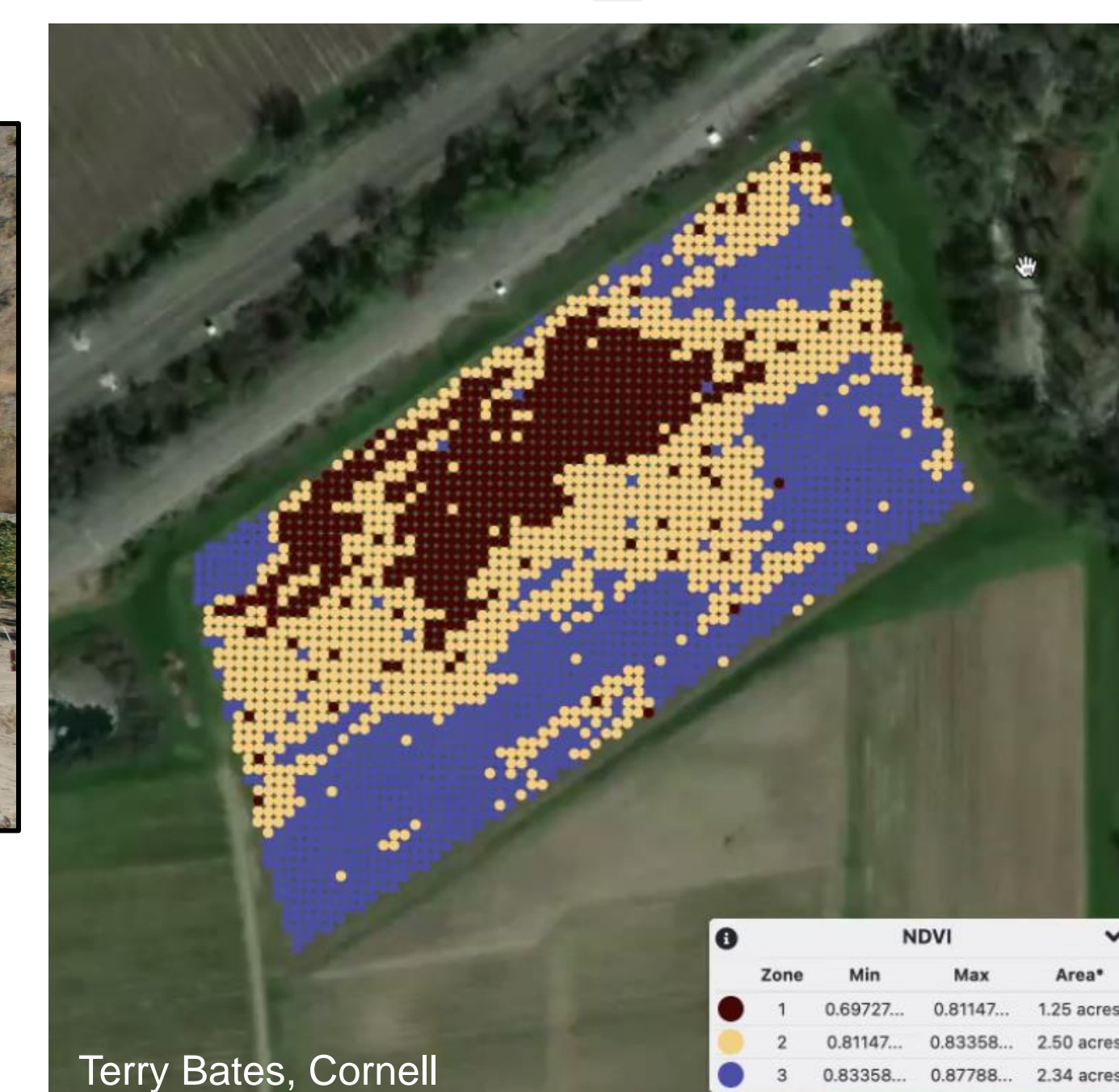
2. Determine the efficiency and suitability of precision vineyard nutrient management

Multi-spatial data and algorithms can quantify vineyard nutrient status more rapidly and accurately than traditional grapevine tissue testing and will allow precise nutrient management that is impossible with current industry practices. Research teams are collecting data from aerial and ground-based sensors and developing spatial sampling maps that could streamline future nutrient monitoring efforts.

Precision Management Team: Terry Bates, Justine Vanden Heuvel



Markus Keller, WSU



Terry Bates, Cornell

3. Define grapevine nutrient thresholds based on environment and production market

Nutrient ranges and thresholds that impact plant productivity and fruit quality need to be determined for each grape market. This group is conducting field trials to ground-truth sensor technology with field and lab measurements across the US (OR, WA, CA, NY, VA).

Plant Nutrition & Product Quality Team: Paul Schreiner, Matthew Fidelibus, Jim Harbertson, Markus Keller, Dana Acimovic, Amanda Stewart



Patty Skinkis, OSU

Santosh Kalauni, OSU

4. Estimate the economic impact and feasibility of nutrient management decisions and extend project results

Economics research conducted a meta-analysis of vine nutrient status, yield and fruit composition using data from prior research and current results to develop a yield model to estimate economic impacts. Outreach Programs include the following outputs and reach:

- **HiRes Vineyard Nutrition podcast** – 2 seasons (16 episodes) since October 2022, 634 downloads, ~30 countries
- Website (<https://highresvineyardnutrition.com>) and social media
- 2 Train-the-trainer events since June 2023

Social Science & Extension Team: Patty Skinkis, John Woodill, Nataliya Shcherbatyuk

New Podcast

Season 2, Episode 5

Featuring...



Manushi Trivedi
PhD Student & Research Assistant
Cornell University

Using Satellites to Guide Grapevine Tissue Sampling



HiRes Vineyard NUTRITION



Scan to get to our website

Welcome

Grapevine yields and berry quality are influenced by many environmental factors. Plant nutrition is one of the most important of these, and it can be managed by growers.

Symptoms of vine nutrient issues, such as leaf color and shoot growth, are visible in the field. But, it takes skill and experience for field staff to observe visual cues. This is time consuming and often leaves areas of vineyards unnoticed. Sensors attached to field vehicles or drones can find problem areas across more acres.

Our team is developing sensor tools that measure grapevine nutrient status on-the-fly. We are also determining nutrient levels needed by grapevines in different regions. These values will help determine how to fertilize vineyards. We are working with growers from across the US to see if these methods work. This project will help growers to apply precision management in their vineyards.

We hope you explore this website to learn more about the team, our projects across the US, and results. We are also on social media ([Instagram](#), [LinkedIn](#), and [Twitter](#)). Please follow us to keep up to date with the project activities and findings! Feel free to contact [project members](#) with questions or comments.

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