

## **Heard it Through the Grapevine: Assessing spatial variability in Ontario vineyards**

Jessica Williamson, University of Waterloo; Richard Petrone (University of Waterloo), Riccardo Valentini (University of Tuscia)

Canada's wine industry contributes over \$9 billion towards the national economy, of which \$4.4 billion is generated solely by Ontario wineries. The cultivation of high-quality grapes to produce economically valuable wines does not come without challenges to growers and winemakers alike. Spatial variability in micro-climate and soil conditions have been a long-standing challenge to growers since the start of grapevine cultivation. With the added pressures of adapting to climate change, vineyards will require special management adaptations to achieve high quality berry yields and wines. The role of spatial variability on grape quality is especially important within the three principal growing regions of Ontario, Canada. Here, climate shifting towards longer and warmer growing seasons, with variable precipitation patterns, presents threats to growers in addition to those that already exist due to vineyard spatial variability. This research includes a combination of methods aimed at assessing hydrometeorological components site-wide, as well as between different blocks, rows and among individual grapevines, to best understand spatial differences across two vineyards in the Niagara growing region. VineTalkers, an innovative new tool for collecting biophysical data across large heterogeneous landscapes from individual plants, collected data on water transport, leaf spectrometry, below canopy radiation, and various microclimatic measurements. This data, paired with meteorological and eddy covariance tower findings, presents an opportunity for growers to understand the current state of their vineyards and the spatial variability across their crop, allowing them to make specific, non-uniform, management decisions to enhance grape yield and quality each growing season.