

Devkota, M., K. Mathiason, J. Ye, and A. Fennell. *Using Matlab to Detect Low Temperature Exotherms in Grape Bud Differential Thermal Analysis Scans*. First Annual SDSU Symposium on Biological Research Computing, Brookings, SD, March 8, 2013.

Grape bud freezing tolerance determines what cultivars can be planted in cold climate regions. The bud is the production unit and the most freezing sensitive tissue in the grapevine. The objective of this study is to determine the low temperature limits of a genotype and use this information to map freezing tolerance genetics. We used differential thermal analysis (DTA) to measure low temperature exotherms (LTE) of single and multiple bud samples to determine bud freezing tolerance. LTE peaks were detected from the DTA scans both manually and using Matlab. Manually, the peaks were visually identified on individual graphs. In Matlab, peaks were identified by fitting a polynomial of suitable degree to raw data files and shifting by certain values. Peak detection is currently being refined to provide maximum peak values for comparison with manual peak identification.