UAV borne Hyperspectral Crop Disease Detection in Processing Tomatoes" to improve farm performance in Processing Tomatoes in Victoria.

Funded by the Horticulture Innovation Fund of the Department of Economic Development, Jobs, Transport and Resources (DEDJTR)

THE UNIVERSITY OF MELBOURNE

Australian Processing Tomato Research Council Inc.

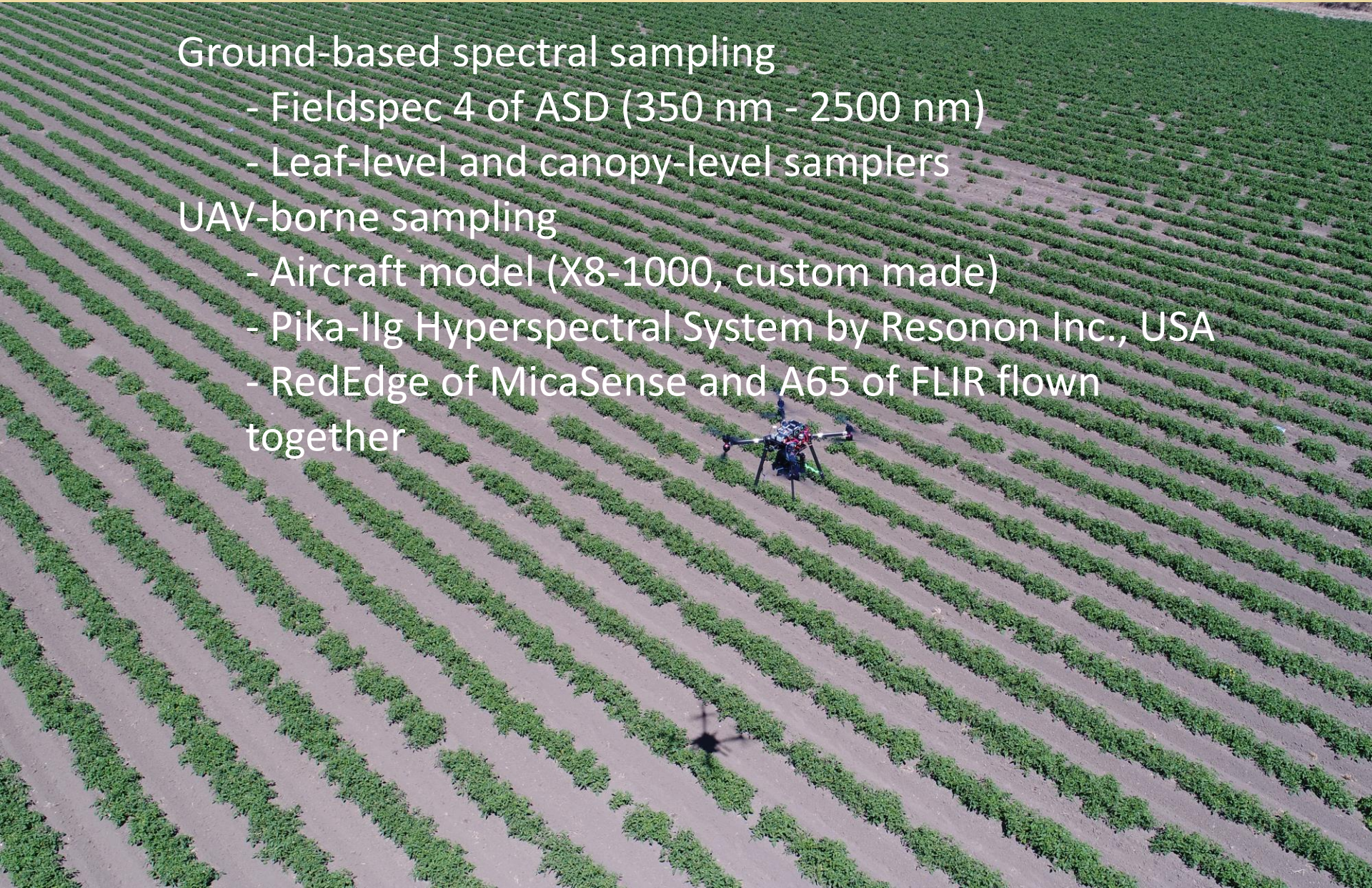
Collaborators

- Liz Mann of the Australian Processing Tomatoes Research Council, Inc.(APTRC),

A multidisciplinary research team of the University of Melbourne (UoM):

- led by Associate Professor Dongryeol Ryu (Engineering),
- Drs. Lola Suarez (Engineering),
- Dorin Gupta (Agriculture and Food), and
- Sigfredo Fuentes

Data Collection



Ground-based spectral sampling

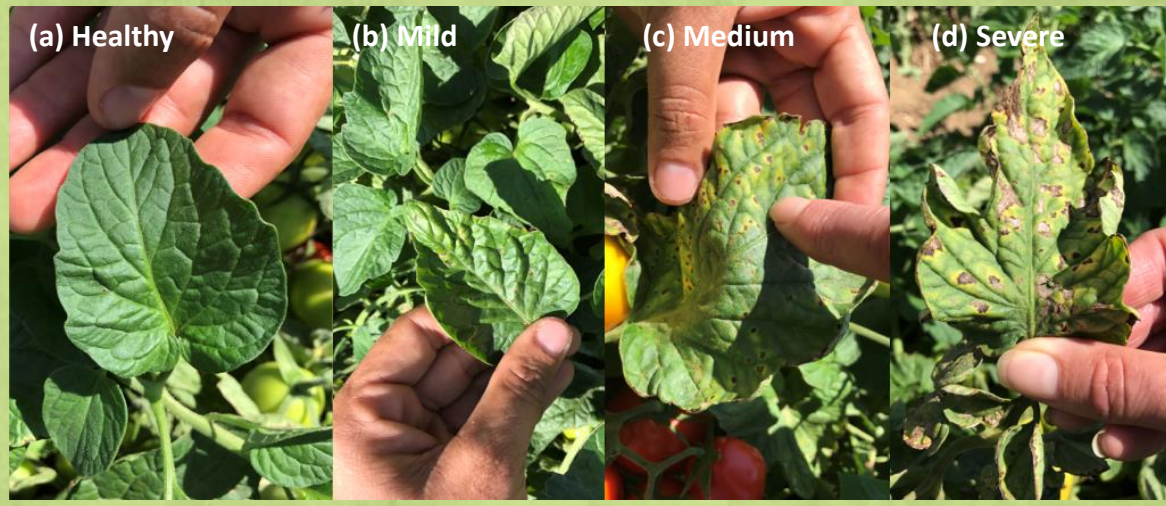
- Fieldspec 4 of ASD (350 nm - 2500 nm)
- Leaf-level and canopy-level samplers

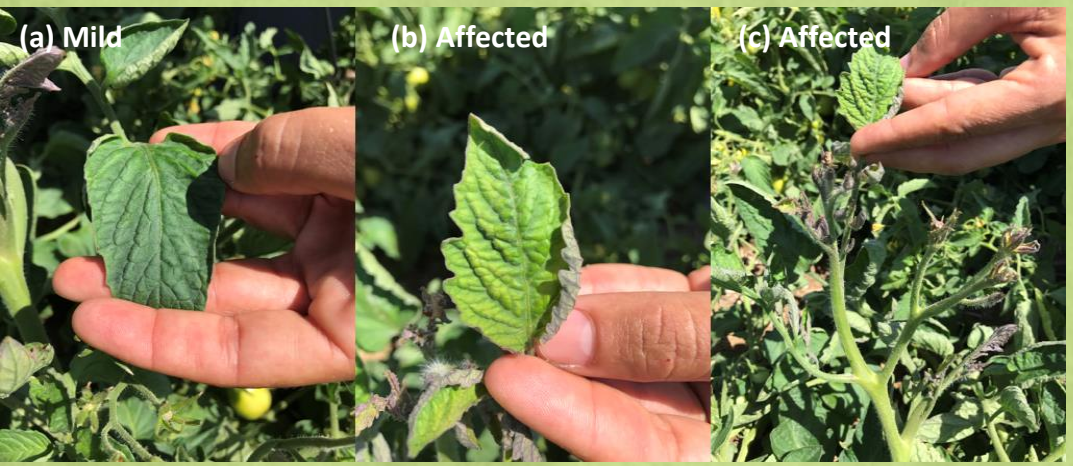
UAV-borne sampling

- Aircraft model (X8-1000, custom made)
- Pika-IIg Hyperspectral System by Resonon Inc., USA
- RedEdge of MicaSense and A65 of FLIR flown together

Bacterial Canker Symptoms

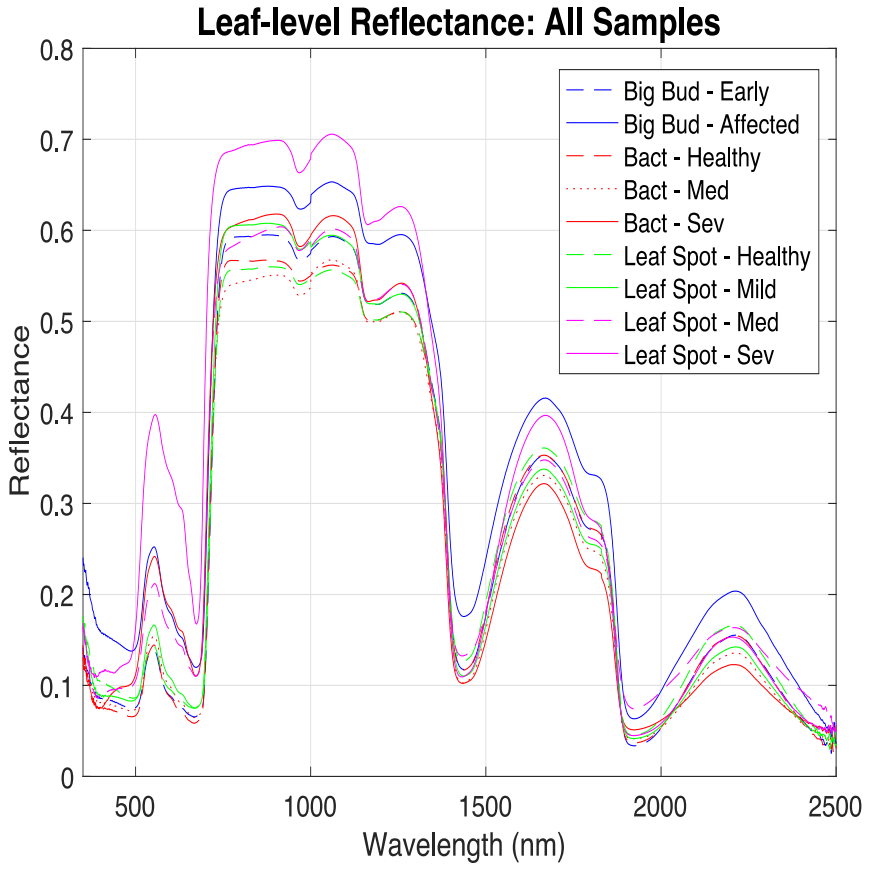
Bacterial Speck Symptoms

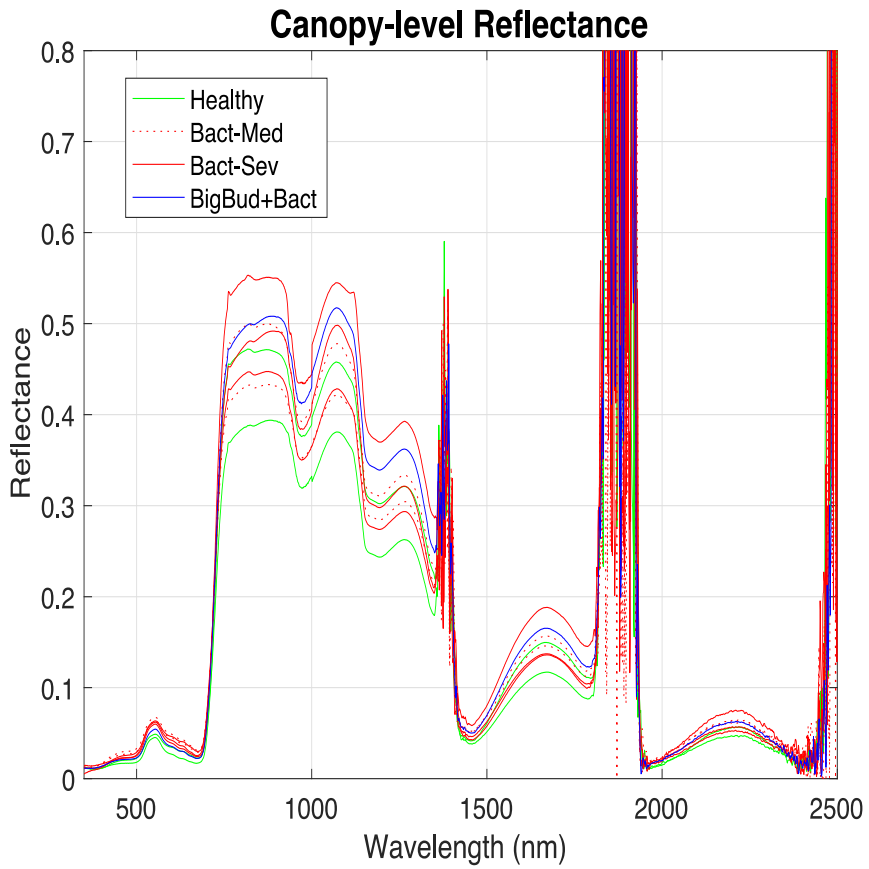




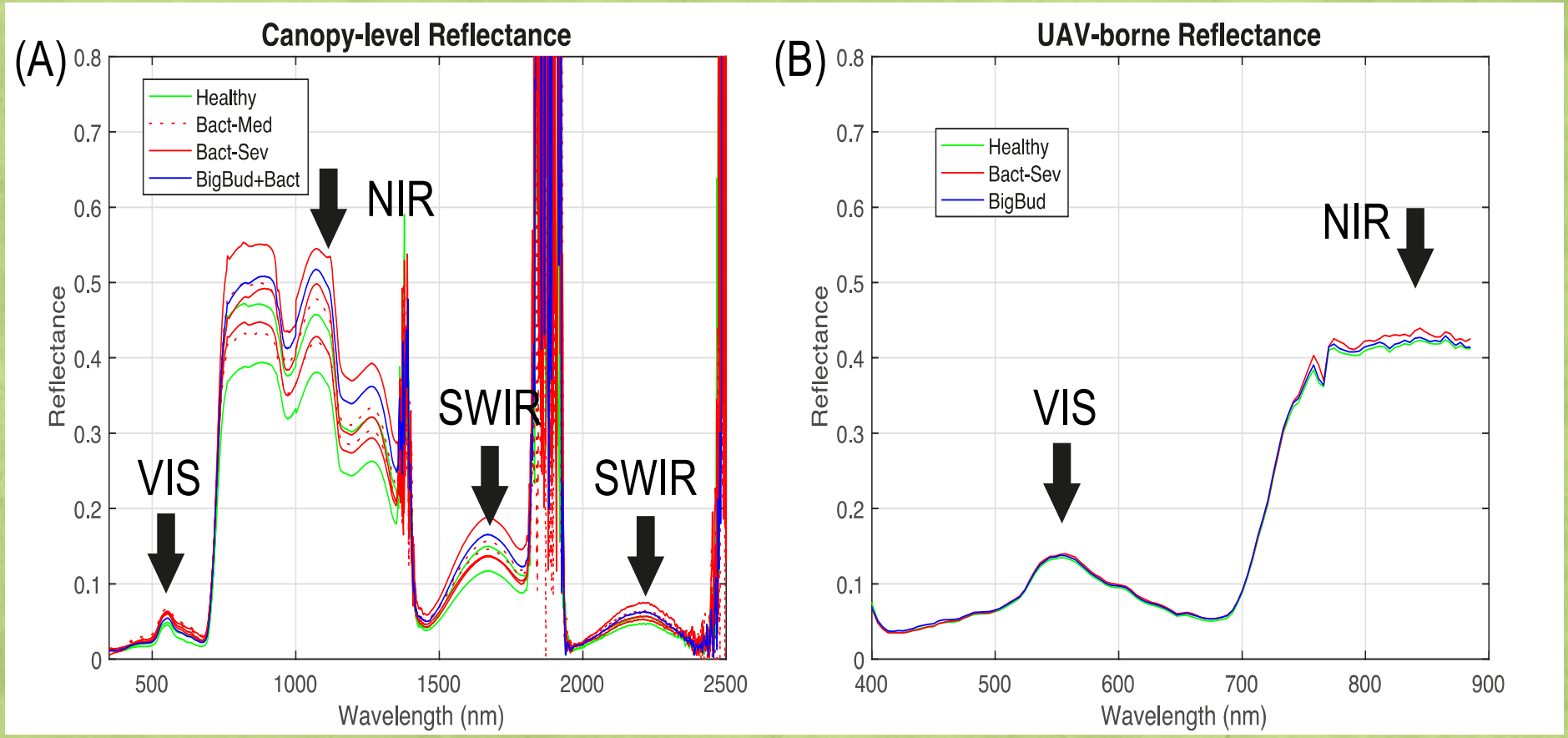
Big Bud Symptoms

Comparison of canopy-level spectral samples (right panel) for bacterial canker and big bud infected plants with the compiled spectral samples of diseases at leaf level (left panel).





Comparison of the UAV-borne spectral samples (right panel) with the canopy-level spectral samples (left panel) for bacterial canker and big bud infected plants.



In Summary:

- Ground-based hyperspectral samples present very promising spectral signals for the studied tomato diseases
- Strong disease signals observed at the leaf level reduces at the canopy level, especially for the VIS spectrum

  - **Possible application of sensors at ground level in the future**