Cranberry Field Decline Project Update

Cranberry bog exhibiting Cranberry Field Decline symptoms

The Cranberry Field Decline Project is a three year research project focused on characterizing a set of symptoms in the field that has been termed Cranberry Field Decline. (This term was suggested by growers to ensure that it is not confused with Dieback). The BCCMC and Ocean Spray have both contributed funds to the project to complete the first year of field work. This project builds on previous projects carried out evaluating potential causes of CFD. Drs. Sheila Fitzpatrick, Agriculture and AgriFood Canada and Siva Sabaratnum, BC Ministry of Agriculture have investigated the impact of insects, disease and nematodes on the beds and Dr. Bob Martin, USDA-ARS, is currently conducting a survey to identify potential viruses. These studies have not identified a consistent or clear relationship between CFD or pest pressure, therefore this project is focused on understanding the physical and physiological conditions that exist in affected fields to better understand the symptoms. There are three primary objectives for this project:

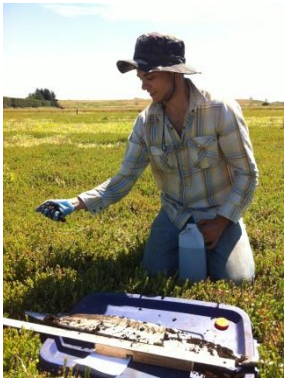
1. *Examine, map and describe the distribution and spread of cranberry field decline over the past 10 years.* The spatial and temporal spread of cranberry decline is currently unknown. We know, anecdotally, that the condition is increasing however the specific rate and pattern of change has not been quantified. The first step in this research will be to detect and quantify cranberry decline using current imagery. Once it is possible to reliably identify affected canopies we will map the distribution over a wide area within the BC cranberry growing region. Next, we will utilize current and historical imagery to develop a time series representing the development of cranberry decline over time and investigate what landscape factors may be involved.

2. *Conduct a detailed characterization of plant growth and soils in selected cranberry beds to evaluate factors that may be correlated with cranberry field decline symptoms.* The proposed work is focused on developing an understanding of the specific soil characteristics associated with fields exhibiting CFD. This work will serve two functions 1) provide ground truthing for the satellite imagery analysis and ground penetrating radar and 2) provide extensive analysis of the soil conditions and plant growth in beds with and without CFD to identify contributing factors. The data generated will be used to determine the potential of using the digital imagery as a diagnostic tool. The soil data will be analyzed with the plant growth data to identify possible relationships between the soil conditions and plant growth characteristics.

3. *Conduct field trials to evaluate management techniques on beds affected by Cranberry Field Decline.* A demonstration trial will be established in year 2 of the project to evaluate the impact of different

management techniques. The treatments included in this trial will be informed by the data collected during the 2015 summer and designed to address some of the potential causes that have been identified over the course of this seasons work.

Meet the Research Team! The research team leading the project is Dr. Rebecca Harbut, Kwantlen Polytechnic University, Dr. Peter Oudemans, Rutgers University, Dr. Les Lavkulich, University of British Columbia and Brian Mauza, Ocean Spray. We also have three summer Research Assistants that you will see around the cranberry bogs all summer collecting data, Taku Someya and Riley Riddell are on KPU's research staff for the summer and Leanne Ejack is working at Ocean Spray with Brian this summer and will be assisting with the project as well.



Riley Riddell and Taku Someya take 1 meter soil cores and characterize the peat layers in fields affected by CFD.

Grower Advisory Board. A grower advisory board has been formed to assist the research team with the project. The board met in April prior to the implementation of field data collection. The project was reviewed and input from growers about the project. The Advisory Committee will meet again in July, Sept, Nov, Jan, March). Thank you to the 11 growers that are serving on the committee!

Progress Report:

Satellite Images. Dr. Oudemans has been working on collecting data from satellite images that will be used to determine the spatial and temporal spread of CFD.

Field Data Collection. Taku and Riley have been spending a lot of time in the cranberry beds collecting data on the sites. Data collected includes:

- Generation of GIS maps of the research beds that can be used to correlate with the satellite images and additional image data collected.
- Upright and flower counts – 7 sqft. Samples at each of the 5 research beds have been counted for vegetative and flowering uprights, flower number, canopy depth
- Soil cores – approx. 20 soil cores at each bed, about 1 meter depth. Core data collected: depth of peat and mineral layers, Van Post scale of humification (degredation) rating of peat at different depths (will be completed by July 10)

- Ground Penetrating Radar (GPR) – on June 17, the GPR crew and Dr. Lavkuliches group was out testing the GPR to collect data on the bed. This data will be analyzed to determine the utility of GPR to characterize cranberry bed soil profiles.

Crews run ground penetrating radar equipment over cranberry bed to collect data on soil profile

Upcoming Data Collection in July: Soil samples will be collected from each of the 5 study sites with samples from affected and unaffected areas. Samples will be used for detailed analysis in Dr. Lavkulich's soils lab at UBC.

We are very grateful to the growers that have been so willing to let us establish research plots on their beds and collect data. If you have any comments/questions/suggestions about the project, please don't hesitate to contact me (rebecca.harbut@kpu.ca).