

Graduate Module

Title: Greenhouse Design Technology Impact on Microclimate and Plant Growth

Instructor: Dr. Lord Abbey (email: labbey@dal.ca)

Timing: Summer 2016 (4 weeks between July and August)

Module Description

Greenhouse technological input can vary from basic technology to a more expensive and sophisticated technology depending on scale of production, choice of structure, and climate control and monitoring systems. These can affect the climate (i.e. temperature, relative humidity and light) and energy-use efficiency by plants, generally termed as microclimate inside the greenhouse. This module is intended for graduate students in the Faculty of Agriculture who are interested in greenhouse structural design, climate system and production operations. Students will learn how natural light transmission and radiant energy inflow into a greenhouse can be influenced by structural design and greenhouse glazing material. Students also learn how diffused light through for instance, polyvinyl fluoride glazing material becomes more available to plants as compared to direct light penetration through a clear polyethylene glazing material. Students will have experiential learning on assessing how ambient conditions relate to greenhouse environment conditions, perform heat calculations and use of vapor pressure deficit to predict plant growth.

Learning Outcomes: At the completion of the module the learner should be able to:

- 1) Explain the concept of greenhouse effect and heat loss
- 2) Describe common greenhouse design technology (i.e. high-, medium- and low-technology)
- 3) Analyze greenhouse microclimate impact on plant growth

Format: The module will be delivered by lectures (1 hr/wk), self-learning and group assignment.

Evaluation: Reading assignment @ 35%, test @ 25% and group work and presentation @ 40%.