

BAGB410 Crop Biology and Physiology

ECTS Value: 5 ECTS

Overall Objectives and Outcomes

This module will provide participants with the underpinning knowledge related to crop production—an essential topic in the pedagogy of agribusiness subjects. The module will cover the key physiological processes that are crucial to understand in order for any plant producer to exploit for the benefit of the farm's operations. This will then lead the learners to be better prepared for other applied units related to horticulture and soil sciences. The unit will also cover general principles of experimental design and how small-scale experiments can be planned to showcase plant physiological processes aforementioned.

By the end of this module, the learner will be able to:

Competences

- a. analyse production practices that limit crop yield;
- b. evaluate crop water and nutrient use;
- c. design experiments to showcase basic crop anatomical and physiological principles.

Knowledge

- a. identify morphological features of crops in different families;
- b. explain the crops' need for water and nutrients;
- c. explain the crops' need for light and optimal temperatures;
- d. describe a range of plant physiological processes;
- e. discuss how crop physiological processes are managed and exploited in commercial settings;
- f. outline basic principles of experimental design.

Skills

- a. compare and contrast different crop morphologies;
- b. plan an irrigation regime for a crop;
- c. provide necessary environmental and cultural requirements for healthy crop growth;
- d. design a range of experiments to showcase basic plant morphology and physiology;
- e. decide which is best nutrient to provide in specific cases;
- f. decide how much water is required by a crop in specific cases;
- g. decide which environmental and cultural requirements are required to grow a healthy crop;
- h. decide which experimental setup to use to showcase various plant physiological processes;

- i. monitor and discuss crop needs with colleagues and superiors;
- j. present environmental data in appropriate scientific style;
- k. illustrate experimental setups required to showcase crop physiological principles;
- l. reflect on best way to match crop needs with resources available;
- m. use available resources to showcase crop physiology principles;
- n. manage digital data to communicate environmental conditions;
- o. operate simple digital instrumentation to measure environmental data.

Mode of Delivery

This module adopts a blended approach to teaching and learning. Information related to the structure and delivery of the module may be accessed through the IfE Portal. For further details, kindly refer to the Teaching, Learning and Assessment Policy and Procedures found on the Institute for Education's website.

Assessment Methods

This module will be assessed through: Presentation and Practical Assignments

Suggested Readings

Core Reading List

1. Hay, R. & Porter, J. (2006). *The Physiology of Crop Yield*, 2nd Edition. Wiley-Blackwell, UK
2. Sabeh, N. (2014). *Tomato Greenhouse Roadmap: A Guide to Greenhouse Tomato Production*. Horti-Americas, US
3. Sadras, V.O., and Calderini, D.F., (2014). *Crop Physiology: Applications for Genetic Improvement and Agronomy*.
Hasanuzzaman, M., Fujita, M., Nahar, K., Hawrylak-Nowak. *Plant Nutrients and Abiotic Stress Tolerance*. (2018). Springer Singapore.

Supplementary Reading List

1. Davidson, H., Mecklenburg, R. & Peterson, C. (1999). *Nursery Management: Administration & Culture* 4th Edition. Pearson, U
2. Glass, D. (2014). *Experimental Design for Biologists* 2nd Edition. Cold Spring Harbor Laboratory Press, US.