



Elite Scientific Instruments Sdn. Bhd.,  
A-LG-03, Block A , Section 1, Serdang Perdana Selatan  
43300 Seri Kembangan,  
Selangor Darul Ehsan  
Tel : ( 603 ) 8945 6100 Fax : ( 603 ) 8945 7100

Course Title	: <b>Foundation of Plant Physiology</b>	Course Duration	: <b>2 day(s)</b>
Course Code	: <b>FPP</b>	Course Venue	: <b>TBA</b>
Course Category	: <b>Plant Physiology Program</b>		
Course Level	: <b>Refresher</b>	Course Fee	: <b>RM 500 per person</b>

### ➤ **Objective of Training**

At the end of the course, the participants will be able:

- 1) To understand the basic requirements of plants to live healthily that can also be manipulated to understand plants' responds and functions
- 2) To better understand the technical aspects of Portable Photosynthesis System, LI-6400 & LI-6400XT, their principles and working operation in relation to plant requirements and functions.

### ➤ **Background facilities**

The training workshop will be completed in two sessions, Theory Session on Day 1 and Practical Session on Day 2 to ensure all participants have a good comprehension regarding the subject matter. The venue for the training course will be announced **one month** before the scheduled date of the workshop.

### ➤ **Background of Speaker**

This course will be given by our Plant Science Consultant, **Dr Muhammad Nazmin bin Yaapar** who has a wide knowledge and experience in general plant physiology and rice science research. Dr Muhammad Nazmin Yaapar is affiliated to the Department of Crop Science, Universiti Putra Malaysia, where he is currently working as a Senior Lecturer. He has experience in teaching various plant science subjects at university level including agriculture botany, weed science, crop nutrition, rice production and crop physiology. He has authored and co-authored several national and international publications and also working as a reviewer for reputed professional journals. Moreover, he is having an active association with a photosynthesis research team in the United Kingdom. He has been regularly recognised by the local media as the reference scientist particularly in rice cultivation and crop improvement.

### ➤ **Introduction**

It is an exciting time to discover and understand plant functions under various stimulations and environmental conditions. The pace of such an endeavour is accelerating thanks to innovative techniques and equipment which also develop rapidly with time. However, the use of any tools is only proper and thorough once the fundamental of things beings measured is sufficiently understood. This module will assist anyone in the field of plant physiology to have a good comprehension about physiological processes in leaves focussing on photosynthesis, as well as environmental factors that influence its performance. This fundamental knowledge is the first step

to ensure correct experimental strategy as well as choosing relevant parameters in any scientific work to understand plant functions and responses.

➤ **Target Group**

This training is designed especially for beginner researcher who intend to do sound scientific measurements in plant physiology. Intermediate researchers who wish to revisit the often-overlooked concepts in plant physiology.

➤ **Course Outline**

**Slot 1: Introduction to the Plant Kingdom**

- General plant groups and implications on research suitability
- Plant parts important in photosynthesis: Roots, Vascular System, Leaves and Cells
- Roots- types, anatomy and functions
- Vascular system anatomy and functions
- Leaf types, anatomy and functions
- Cell anatomy and biology
- Q and A session

**Slot 2: Five Basic Needs of Plants**

- Air: Temperature, Humidity, CO<sub>2</sub> and O<sub>2</sub> concentration
- Light: Spectrum, Intensity, Photoperiod
- Water: Temperature, pH, EC, Oxygen content
- Nutrients: Composition, Purity
- Growing Medium: Air content, Moisture content
- Q and A session

**Slot 3: Chloroplast Anatomy and Components Details**

- Light-dependent reactions: PS II, pigments, electron transport, ATP and NADPH production
- Light-independent reactions: Calvin cycle, Rubisco, G3P
- Stomata
- Photorespiration
- C<sub>3</sub> vs C<sub>4</sub> vs CAM plants
- Q and A session

**Slot 4: Handling and Maintenance Equipment / Demonstration**

- Components of equipment and functions
- Preventive maintenance

**Slot 5: Data Interpretation and Analysis of Result**

- Data output and networking
- OPEN Instrument Software



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➤ **Tentative program**

Date & Time	Activities	Venue
<b><u>Day 1</u></b>		
8:00 AM	Registration	TBA
9:00 AM	<b>Slot 1: Introduction to the Plant Kingdom</b>	
10:30 AM	Break	
11:00 AM	<b>Slot 2: Five Basic Needs of Plants</b>	
1:00 PM	Lunch break	
2:00 PM	<b>Slot 3: Chloroplast Anatomy and Components Details</b>	
4:30 PM	Dismiss	
<b><u>Day 2</u></b>		
7:30 AM	<b>Slot 4: Handling and Maintenance Equipment/ Demonstration</b>	TBA
	Break	
9:30 AM	<b>Slot 5: Data interpretation and analysis of the result</b>	
12:00 PM	Closing ceremony / Photo session/ Lunch break/ Dismiss	