

# 2014 TWINCLE PROGRAM

at Chulalongkorn University Demonstration Secondary School



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**1<sup>st</sup> week (19-22 AUG):**

## Growing Plants Hydroponically

### WHAT IS A PLANT FACTORY?

The Main types of plant factories

#### 1. Sunlight-type

- Features
- Appeal points

#### 2. Fully artificial light-type

- Features
- Appeal points
- An actual example at Fukushima
- About our research



### Objectives

- Let students become familiar of the latest technology in horticulture
- Let students realize some difference in environment between Japan and Thailand

### Good points

- Used easy words and many pictures
- The example at Fukushima clearly showed necessity of plant factory to students
- Many questions provoked students' thinking

### Improvements

- Should have explained more details (the relationship between light color and plant growth, etc.)
- Our responses to students' questions



## BUILD YOUR OWN HYDROPONIC SYSTEM

### - Industrial Arts

Let's grow lettuce on Styrofoam Raft in a small bucket! This is called, "Raft system". It's the simplest and easy way to grow plants hydroponically. You will need some materials for building the system, such as small air pump, plastic tube, and air stone (aquarium bubbler) to deliver oxygen to lettuce. We reminded them to provide nutrient solution and change the bucket water at a proper interval. By doing so, they can harvest fresh lettuce from the shelf by the window of their classroom or house all year round.



### Objectives in making the system

Hydroponics is the better way to overcome global food and water shortages, and produce high quality and nutritious produce anywhere.

We let the students know about it and try to make their own system to grow some vegetables by themselves. We hoped them to be familiar with hydroponics and think about safe food production all over the world in the future.

**2<sup>nd</sup> week (25-29 AUG):**

## Plant pathology & Fungi observation

### PLANT PATHOLOGY

#### 1. About, "Coffee rust"

#### 2. About our research

Selective Medium - *Diaporthe sclerotioides*

### OBSERVATION

Fungi are around you!

- Fungi observation to conduct comparison between selective medium and normal medium

### Objectives

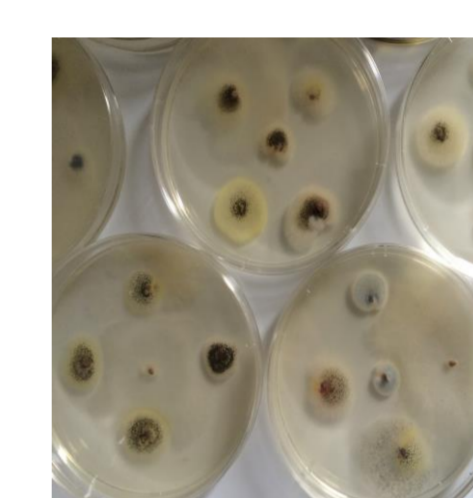
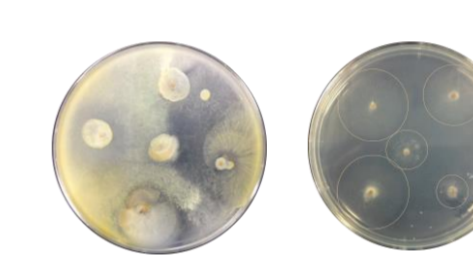
- Know the disease of the plant
- Realize the importance of the selective medium

### Good points

- Used fungi in our surroundings
- Used concrete example to understand history of plant disease

### Improvements

- Added explanation of technical terms
- Enunciation
- Made our voice more audible



### Observation activity

1. Collected garden soil and organic matters-in tubes.
2. Cultivated it for three days.
3. Inoculated two kinds of media and cultivate them in a refrigerator.

### Observation

On the left side, only one kind of fungus grew. We explained the necessity of **selective medium by comparing it with PDA medium.**

### Reaction

- Enjoyed; it's the first time to observe fungi
- Selective medium is difficult to understand

## VISIT TO A HYDROPONIC FARM

### - Bangsai Agricultural Center

This farm is located at Navamintra. It takes about one hour by taxi from the university. This farm uses hydroponic system to cultivate green vegetables. Products quality was very good. We couldn't find disease and insect-infested vegetables.

### Comparison with Japan

In Japan, a lot of seedlings are grown in the fully artificial light-type of plant factories. However, In Thailand, sunlight-type of plant factories are used for seedlings. As compared with Japanese system, the initial and running costs are lower. In addition, in Thailand's system, there are seedlings on Styrofoam sheet floating on water. Thereby, they prevent the death of seedlings due to too high temperature. It is an effective method in countries with tropical climate.



Appearance



During seedling  
Upper: Inside the facility  
Lower: From the outside of the fly screen

## CONCLUSION

Students actively participated in our class. They willingly answered our questions and shared their opinions. They seemed to be more obedient and cheerful than Japanese students. We were surprised that the majority of students were able to comprehend the technical contents of our lesson. We were glad because several students came after class for additional questions. It seemed they got interested in plant factory system and plant pathology.

Through this program, we realized the difficulty of making the lecture about our study. The experience of this program led to improvement of our presentation skills and maintenance the motivation of the study.

