Educational Program with Agricultural Practice and Sensor Data Analysis for Primary School Students

-Dr. Doroemon Project-


Hanae Yokokawa, Masaru Mizoguchi

Graduate School of Agricultural and Life Sciences, The University of Tokyo

Abstract

We propose an educational program “Dr. Doroemon Project” which includes thinking training through rice cultivating and sensor data analysis for primary school 5-6th students. The purpose of this research is to find how this program encourages thinking of children through rice cultivating. As a result this program could provide such opportunities of thinking, to compare and correlate multiple elements, express findings in objective and find cause and effect.

1. Introduction

1.1 General agricultural education in Japan

- 79% of primary schools have “agricultural practice” time in Integrated studies subject [1]


Fig.1-2 Japanese pupils are planting and harvesting rice

1.2 Overview of Research

Practice + Problem-solving learning

To extend the abilities to think, make decision and express

2. Method

2.1 Mission for pupils

Cultivating rice in SRI method and finding why SRI succeed

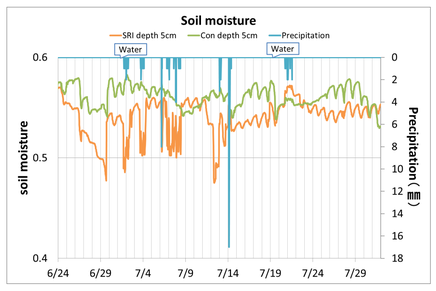
Fig.3 Comparing conventional and SRI method

Conduct in the bucket

- New rice farming method
- 20-50% and sometimes 100% or more yield

Fig. 4 Rice in the bucket with sensors


Sensors and data logger (Decagon Inc.)



2.2 Contents

i pad mini
Screen

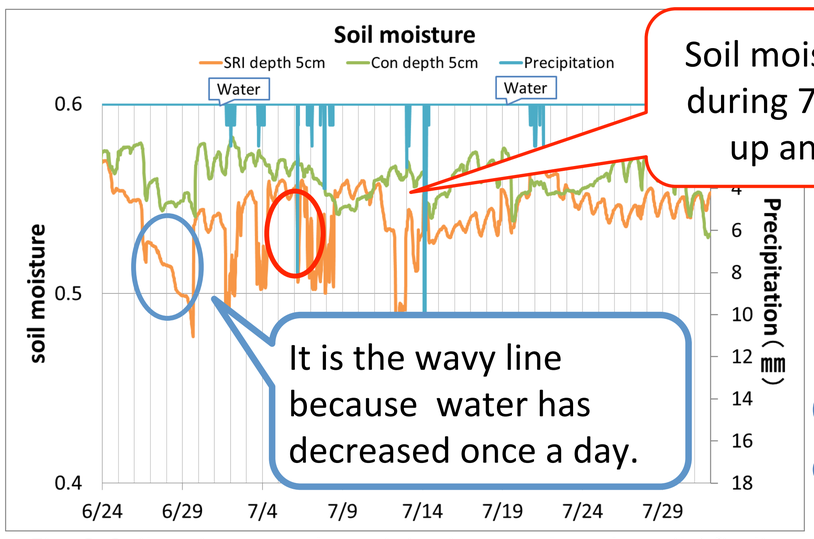
Slide show

Fig. 5 Discussion in the classroom

Practice	Learning	Sensing
■ Transplanting ■ Water supplying ■ Harvesting ■ Eating	■ Recording height and tiller ■ Individual work on sensor data graphs ■ Discussion	■ Using soil moisture sensor ■ Data logging

3. Result and Discussion

3.1 Kinds of pupil’s findings



Soil moisture of SRI during 7 to 9 July is up and down.

Objective

It is the wavy line because water has decreased once a day.

Cause and effect

Fig. 6 Soil moisture and precipitation graph and pupils’ findings

The range of temperature of conventional method is wider.

Compare

Correlate

Soil temperature rises as the energy of the sun increases and it lowers as the energy of the sun decreases.

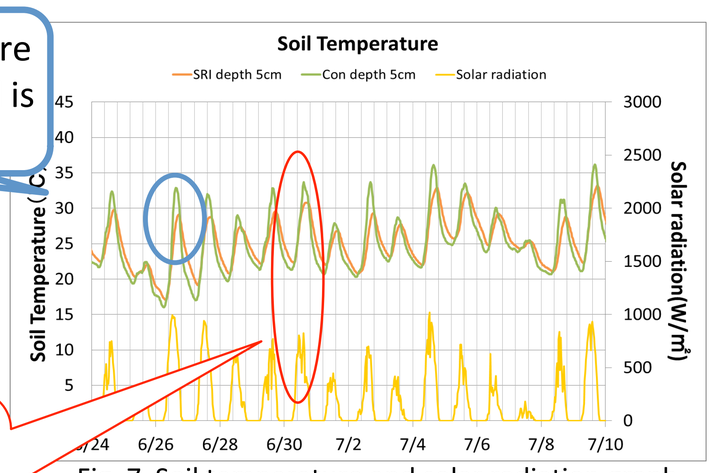


Fig. 7 Soil temperature and solar radiation graph and pupils’ findings

Table.1 Number of each kind of findings

Finding	Soil mois. Graph	Soil Temp. Graph
Compare	24	17
Correlate	6	7
Objective	18	3
Cause and effect	1	2
Sum	39	43

pupils got the opportunities to compare, correlate, express in objective and find cause and effect in this activity

4. Conclusion

- We suggest educational program mixed agricultural practice and problem-solving learning
- It could give opportunities for pupils to think on their own through agricultural practice
- Integrated practice is the key point of agricultural practice

Acknowledgements

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[1] "Survey results regarding agricultural experience learning“ RYEDA (2009)