Out-of-Season Sweet Corn Cultivation Control System Using Moisture Management via the BLYNK App

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Introduction

Thailand is one of the world's largest producers and exporters of sweet corn, with 75% of its production exported in the form of canned and frozen corn. Despite being cultivable year-round, sweet corn production faces challenges in some areas due to water scarcity, especially during the dry season when corn requires consistent watering. In Satun province, for instance, certain areas have reported reduced yields and increased production costs caused by water shortages, directly impacting local farmers. To address this issue, a system for automated irrigation control has been proposed. This system ensures precise water delivery, maintaining optimal soil moisture levels for plant growth. By implementing such technology, the risks of crop damage can be minimized, sweet corn yield and quality improved, and farmers enabled to grow sweet corn effectively even outside of the traditional growing season.

Objective

1. To develop an automated irrigation system to maintain optimal soil moisture for sweet corn cultivation.
2. To improve yield and enable efficient off-season sweet corn farming.

Project Scope

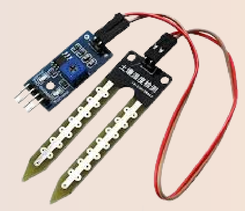
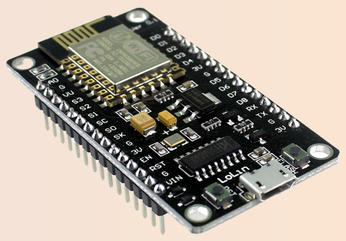
1. Develop and design an automated irrigation system for sweet corn cultivation, utilizing soil moisture sensors and controllers to deliver precise water amounts.
2. Test the system in a trial area with conditions similar to water-scarce agricultural zones in Satun province

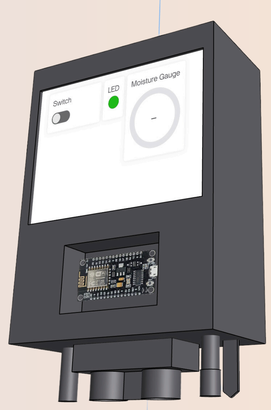
Method

1. Study soil moisture needs and design an automated irrigation system.
2. Develop a prototype using sensors and water control mechanisms.
3. Test the system in water-scarce areas, such as Satun province.
4. Collect and analyze data on yield, soil moisture, and costs before and after implementation.
5. Summarize findings and prepare recommendations for future improvements.

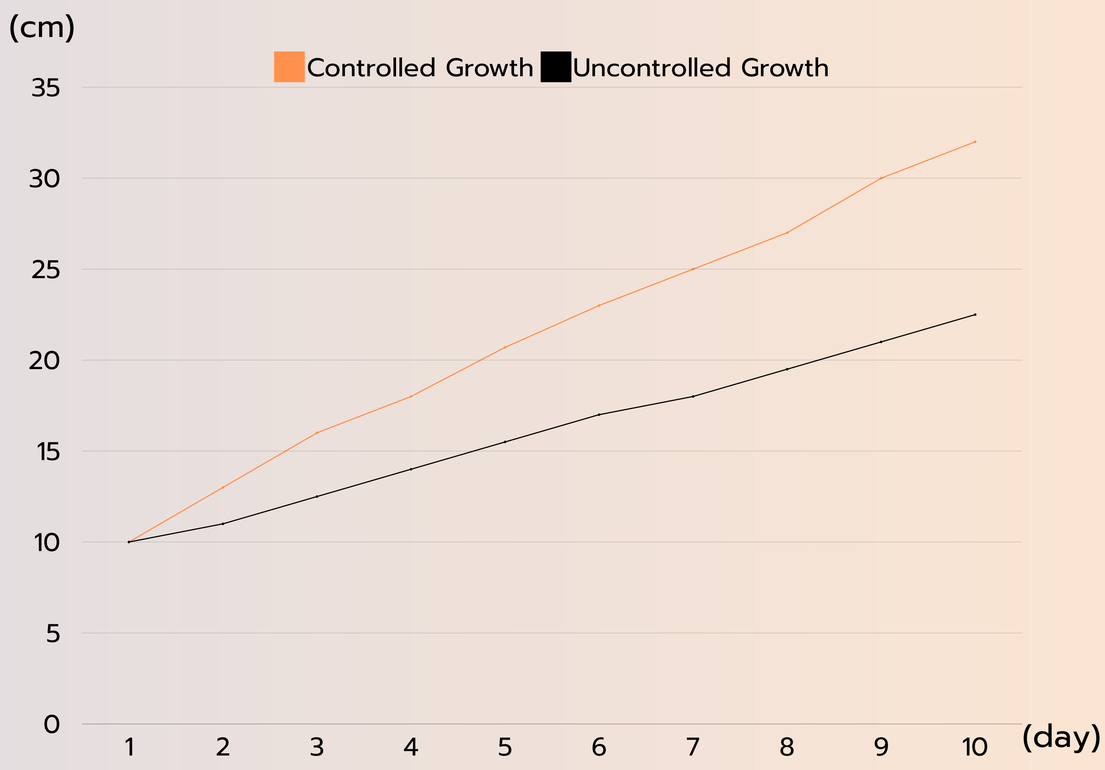
Equipment:

- Soil moisture sensor
- Esp8266
- Mini water pump
- Solenoid valve
- Small water tank
- Tubes and spray nozzles
- LCD display
- Battery or small solar panel
- Wi-Fi or Bluetooth module




Experimental results



Observations

- Controlled Growth: The corn plants grow consistently at around 2-3 cm per day, thanks to optimal soil moisture levels (60-80%).
- Uncontrolled Growth: The growth rate is inconsistent, averaging 1.5-2 cm per day, due to irregular water availability.

Conclusion

Experiment Results:
The automated irrigation system maintained soil moisture at approximately 60-80%, which is ideal for sweet corn growth. The yield increased, and water usage was more efficient compared to traditional irrigation methods.