Studying the soil quality's effect on onion growth in the areas of Ban Khi Nak and Ban Hai Yai.

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Abstract

This research aimed to study the effect of soil quality on the growth of spring onions in two areas: Ban Khin Nak and Ban Hai Yai, Sisaket Province. The study focused on comparing soil properties such as pH, moisture, and nutrient fertility to assess the relationship between soil quality and spring onion growth. Soil samples were collected in equal quantities from both areas. Data on spring onion growth, including height, number of leaves, and growth rate, were collected over a 20-day observation period. The data was then analyzed and compared to determine the optimal soil quality for spring onion cultivation. The results showed that the soil in Ban Khin Nak had a pH range more suitable for spring onion growth than the soil in Ban Hai Yai. Furthermore, it had higher levels of major nutrients such as nitrogen, phosphorus, and potassium, resulting in better spring onion growth in Ban Khi Nak. .

Research Question and Hypothesis

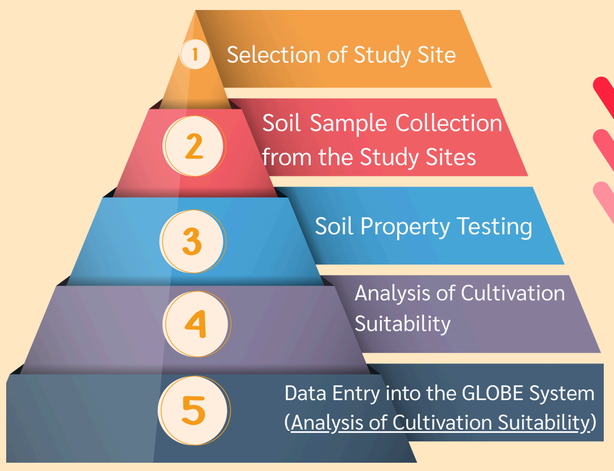
How do the soil conditions and climate that affect the growth of green onions differ between Ban Khinak and Ban Hai Yai?

The differences in soil conditions and climate between Ban Khinak and Ban Hai Yai result in differences in the growth of green onions.

Introduction

Spring onions are an economically important and widely consumed vegetable in Thailand due to their unique taste and aroma, as well as their richness in beneficial nutrients such as vitamins, minerals, and antioxidants. Spring onions can be used in a variety of dishes, both as a fresh vegetable and as a key ingredient in many recipes. Furthermore, spring onions are a popular crop for farmers to cultivate for income generation because of their short growing season, quick yield, and guaranteed market, thus providing a continuous income for communities. However, the growth of spring onions depends on several factors, especially suitable soil and weather conditions. If the growing area has unsuitable soil properties or unfavorable weather conditions, the spring onions may not grow properly or may yield low production (Pariwat Wannathawi. (2018). Effects of soil properties on the growth of kitchen garden vegetables. Journal of Agriculture and Environment, 14(2), 45-52). Therefore, studying and understanding the relationship between environmental factors and spring onion growth is essential. This research aims to compare the soil and weather conditions of the Ban Hai Yai farm and the Ban Khin Nak farm and to study how these environmental conditions affect spring onion growth. The data obtained will be analyzed to recommend appropriate methods for planting and managing onion plots in each area. This will help improve farmers' yields, increase their income, and strengthen the economic stability of communities in the long term. Furthermore, the knowledge from this research can be applied to the cultivation of other similar crops, which will be beneficial in developing a sustainable agricultural system that is compatible with local climate and natural resources.

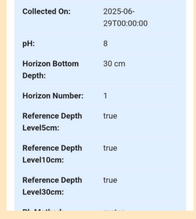
Research Methods and Materials



Selection of Study Site

Soil Sample Collection from the Study Sites

Selection of Study Site



Data entry: Soil Sample Collection from the Study Sites

Materials

1.Soil test kit (N, P, K)

2.Mobile phone

3.Soil thermometer

4.Trowe

5. Pencil and pen
6. Record sheets / notebook
7. Test tube rack
8. Soil sample containers

Results

In this study, researchers collected soil samples from onion growing areas in Ban Khin Nak and Ban Hai Yai. The soil properties, including pH, moisture content, major nutrients (nitrogen, phosphorus, and potassium), and general soil characteristics, were analyzed for comparison with onion growth in each area. The research findings can be summarized as follows:

Data Recording Table

Study	PH	Nitrogen	phosphorus	Potassium	Soil Moisture	Soil characteristict
A	8	medium	high	medium	WET+	loam/Sandysoil
B	4	low	low	trace	WET+	Clay soll

Table 1 Comparison of Soil Properties between Study Areas

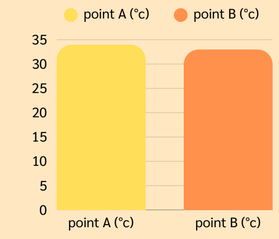


Figure 1 Comparison of Weather Conditions during the Experiment

Sutdy	average temperature
A	33-35
B	32-34

Table 2 Comparison of Average Weather Conditions during the Experiment

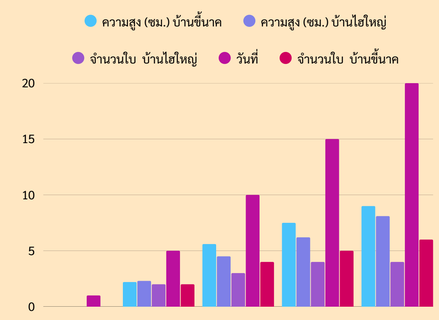


Figure 2 Growth of Green Onions over a 20-Day Period

date	Height (cm) of Ban Khin Nak	Number of leaves Ban Khin Nak	Height (cm) of the large Hai Yai house.	Number of leaves Baan Hai Yai
1	-	-	-	-
5	2.2	2	2.3	2
10	5.6	4	4.5	3
15	7.5	5	6.2	4
20	9	6	8.1	4

Table 3 Growth of Green Onions over a 20-Day Period

Note

Study site A represents Ban Khinak (Latitude: 14.9189184, Longitude: 104.0196239). Study site B represents Ban Hai Yai (Latitude: 14.9445918, Longitude: 104.0524390)

Discussion

The research results clearly showed that soil quality significantly affected the growth of green onions. Soil in Ban Khin Nak, with higher levels of essential nutrients, particularly nitrogen and phosphorus, compared to soil in Ban Hai Yai, resulted in taller green onions with more leaves and a greener appearance. This demonstrates the crucial role of soil nutrients in plant growth. Although the soil pH in both areas was not optimal for green onion cultivation—Ban Khin Nak being alkaline and Ban Hai Yai highly acidic—the experiment demonstrated that sufficient nutrients promoted green onion growth more effectively than pH alone. This aligns with the concept and research indicating that nitrogen is crucial for stem and leaf growth, while phosphorus supports root development. Therefore, it can be concluded that soil nutrient management is more important for increasing green onion yield than controlling soil pH alone. However, improving soil pH to an optimal level combined with nutrient supplementation may further enhance green onion growth in the future.

Bibliography

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Badges