Investigation of Factors Affecting Soil Temperature and Its Impact on Plant Growth

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Abstract

This study aims to explore the impact of different weather factors and latitude variations between years on soil temperature, as well as whether soil temperature affects crop growth. We found that the relationship between air temperature and soil temperature is relatively close, and the differences between years are closely related to the air temperature at that time. Regions with similar latitudes show more similar soil temperature changes, which are related to the local climate and soil properties. Additionally, the experiment revealed that soil temperature has a significant impact on the growth of mung beans. Controlling the temperature can stabilize plant growth.

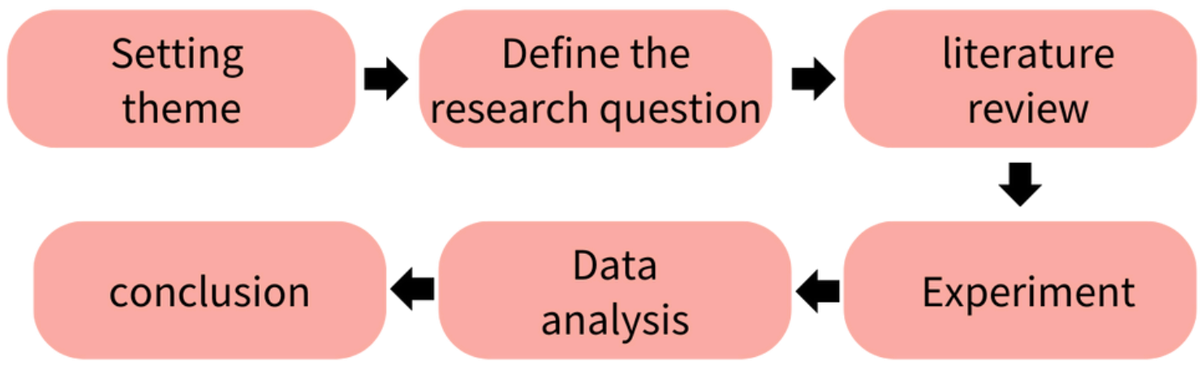
Research Methods

Conduct a literature review, analyze the data from the campus observation station, and finally observe the impact of soil temperature on plant growth through experiments.

Research Purpose

1. Exploring the influence of meteorological factors on soil temperature.
2. To explore the changes of soil temperature between different years.
3. Differences in soil temperature and soil temperature delay at different latitudes.
4. Effects of soil temperature on crop growth

Structure



Result

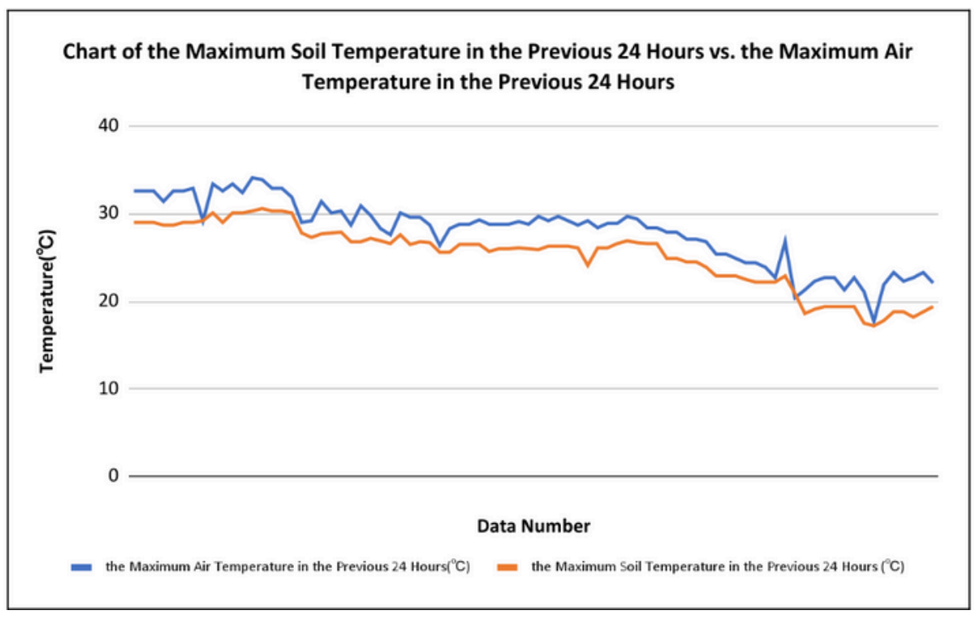


Figure 1：24-hour maximum soil temperature and air temperature variation chart

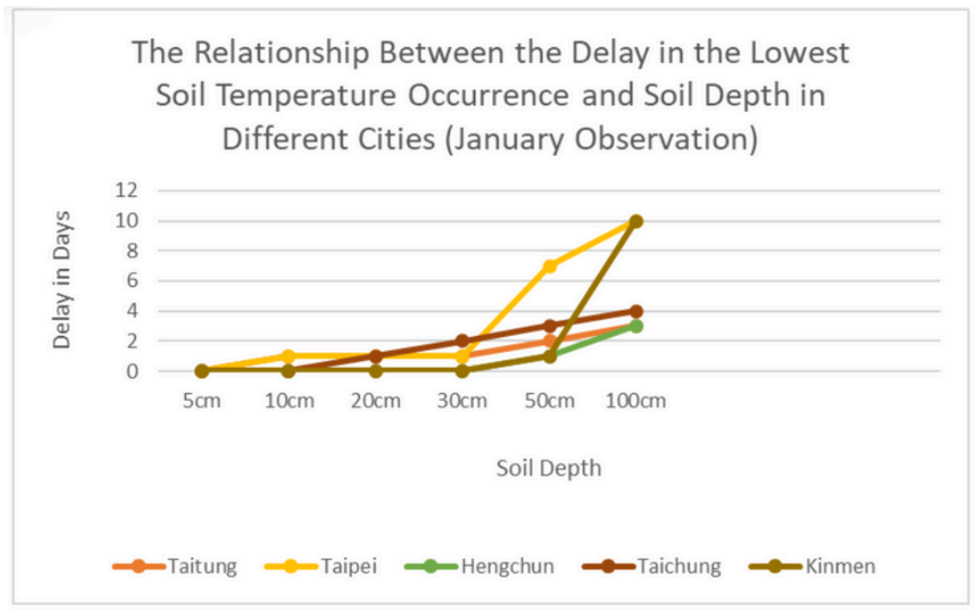


Figure 2：The delay time for the soil temperature at different depths to reach the lowest point in different cities

Conclusion

1. The relationship between air temperature and soil temperature is relatively close, while other meteorological factors will only have an impact in extreme cases.
2. The main reason for the different changes in soil temperature in different years is the climate of that year, which can be traced back to the influence of meteorological factors.
3. Regions with similar latitudes exhibit more similar soil temperature changes. In higher-latitude areas, the northeast monsoon during winter has a significant impact, leading to increased air temperature and soil moisture. Additionally, it was observed that climate, soil moisture content, geographic environment, and temperature delay are strongly correlated.
4. Soil temperature has a significant impact on the growth of mung beans. Covering the soil helps maintain soil moisture and temperature, stabilizing plant growth.