

## Business Question and Visualization Report

Date	25 December 2025
Project Title	Predicting Plant Growth Stages with Environmental and Management Data Using Power BI.
Maximum Marks	5 Marks

### Business Questions and Visualization:

By translating agricultural challenges—such as inconsistent yields and resource wastage—into specific data queries, we determine the necessary Power BI visualizations. These visualizations are designed to uncover critical patterns in soil suitability, fertilizer efficiency, and environmental impact, enabling stakeholders to make data-driven decisions that maximize crop success rates.

#### 1. What is the overall success rate of our plant growth trials?

- **Visualization:** KPI/Card
- **Description:** A large single-value card showing the percentage of plants that reached Growth\_Milestone = 1. (Target: >50%)

#### SCREENSHOT OF VISUALIZATION:

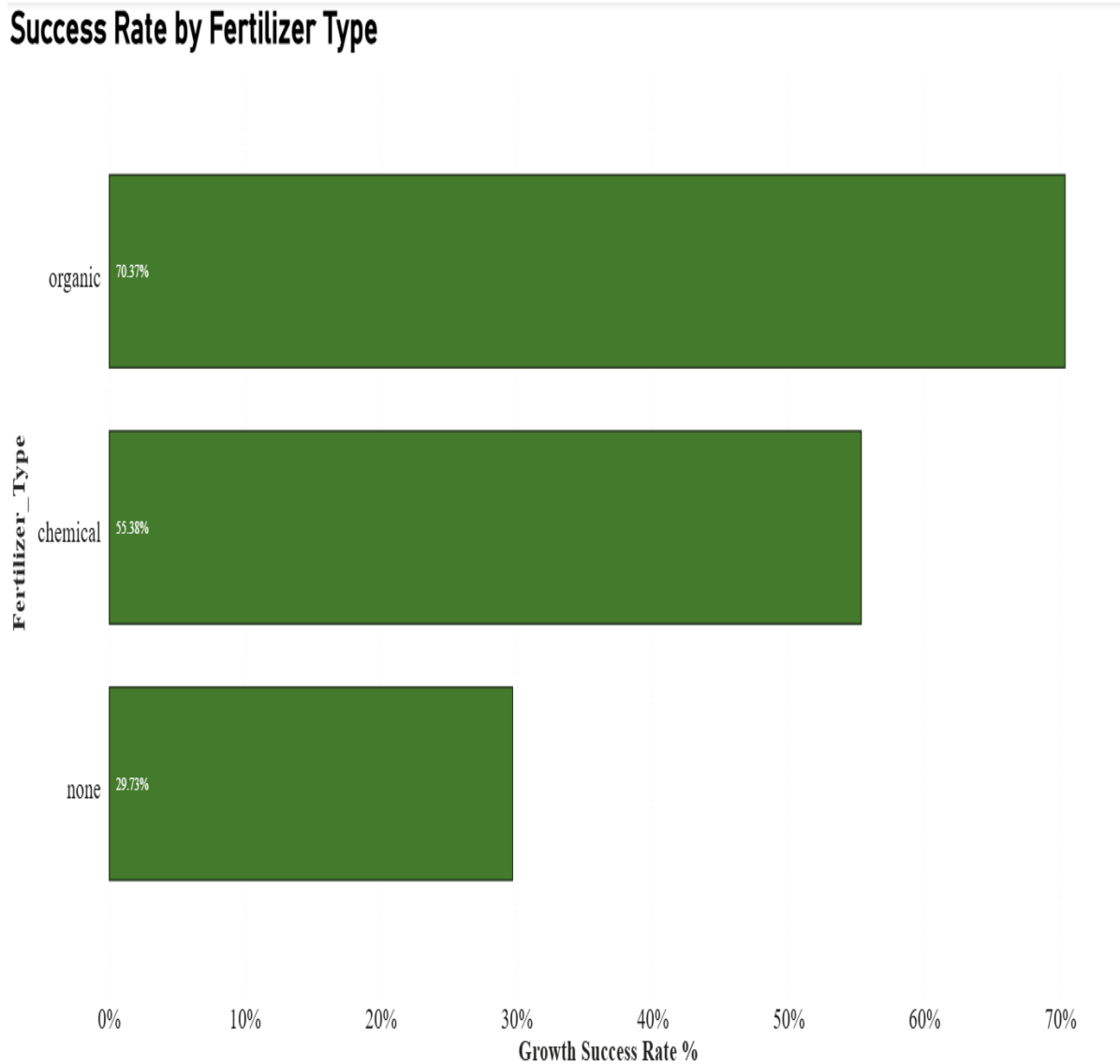
## OVERALL PROJECT PERFORMANCE

**49.7%**  
Growth Success Rate %

## 2. Which fertilizer type is most effective for ensuring plant growth?

- **Visualization:** Clustered Bar Chart
- **Description:** A bar chart comparing the Success Rate (%) across "Organic", "Chemical", and "None". This will visually highlight that Organic (~70%) outperforms the others.

### SCREENSHOT OF VISUALIZATION:

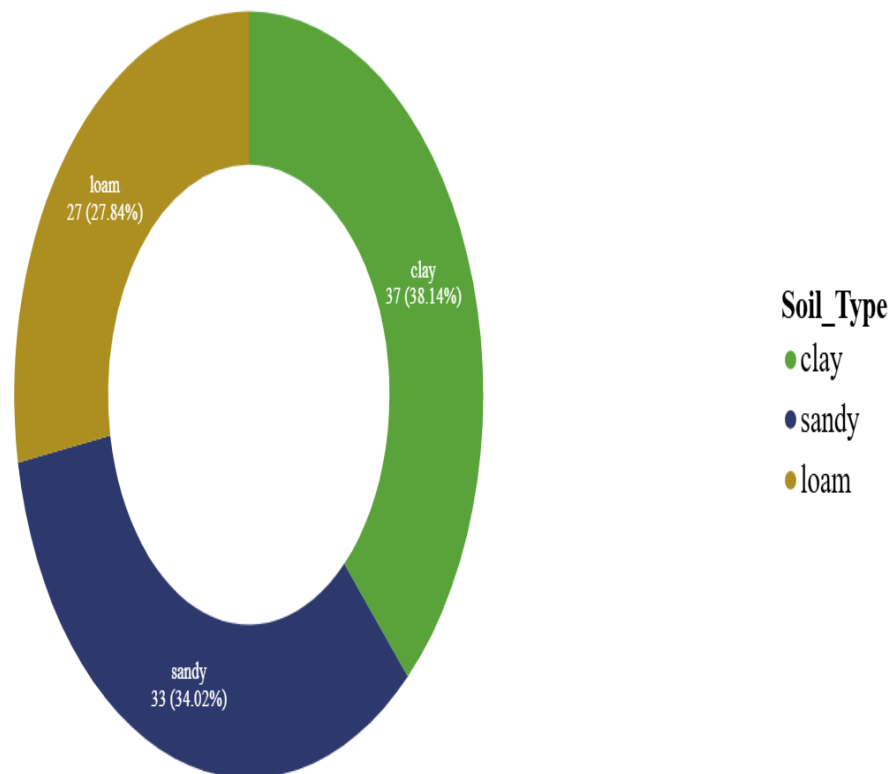


### 3. How does soil type influence the likelihood of growth failure?

- **Visualization:** Donut Chart
- **Description:** A donut chart showing the distribution of "Failed" plants (Growth\_Milestone=0) broken down by Soil\_Type. This helps identify which soil (likely Clay) contributes most to losses.

**SCREENSHOT OF VISUALIZATION:**

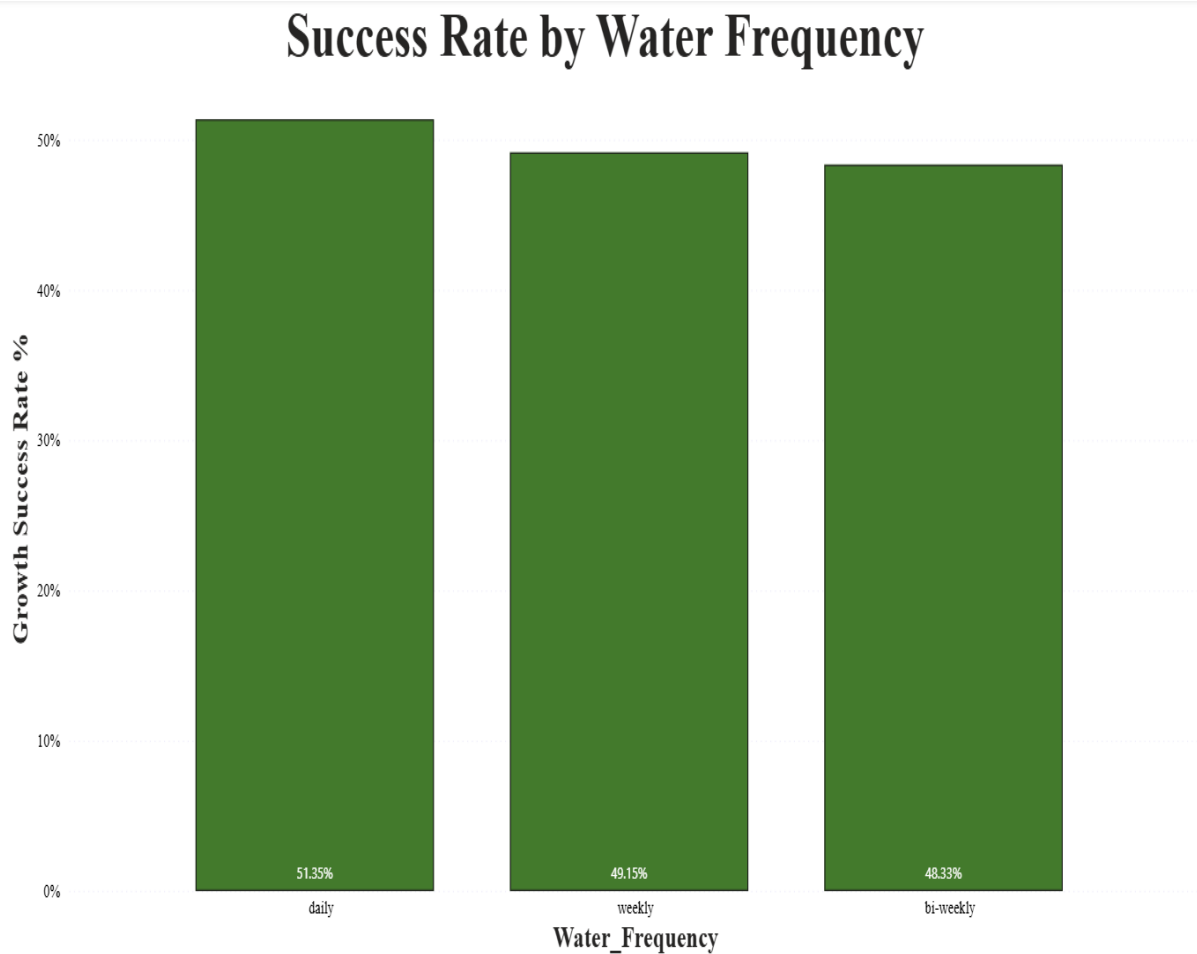
## Failure Count by Soil Type



#### 4. Is there an optimal watering frequency for maximizing yield?

- **Visualization:** Column Chart
- **Description:** A vertical column chart comparing the total count of successful plants for "Daily", "Weekly", and "Bi-weekly" watering schedules.

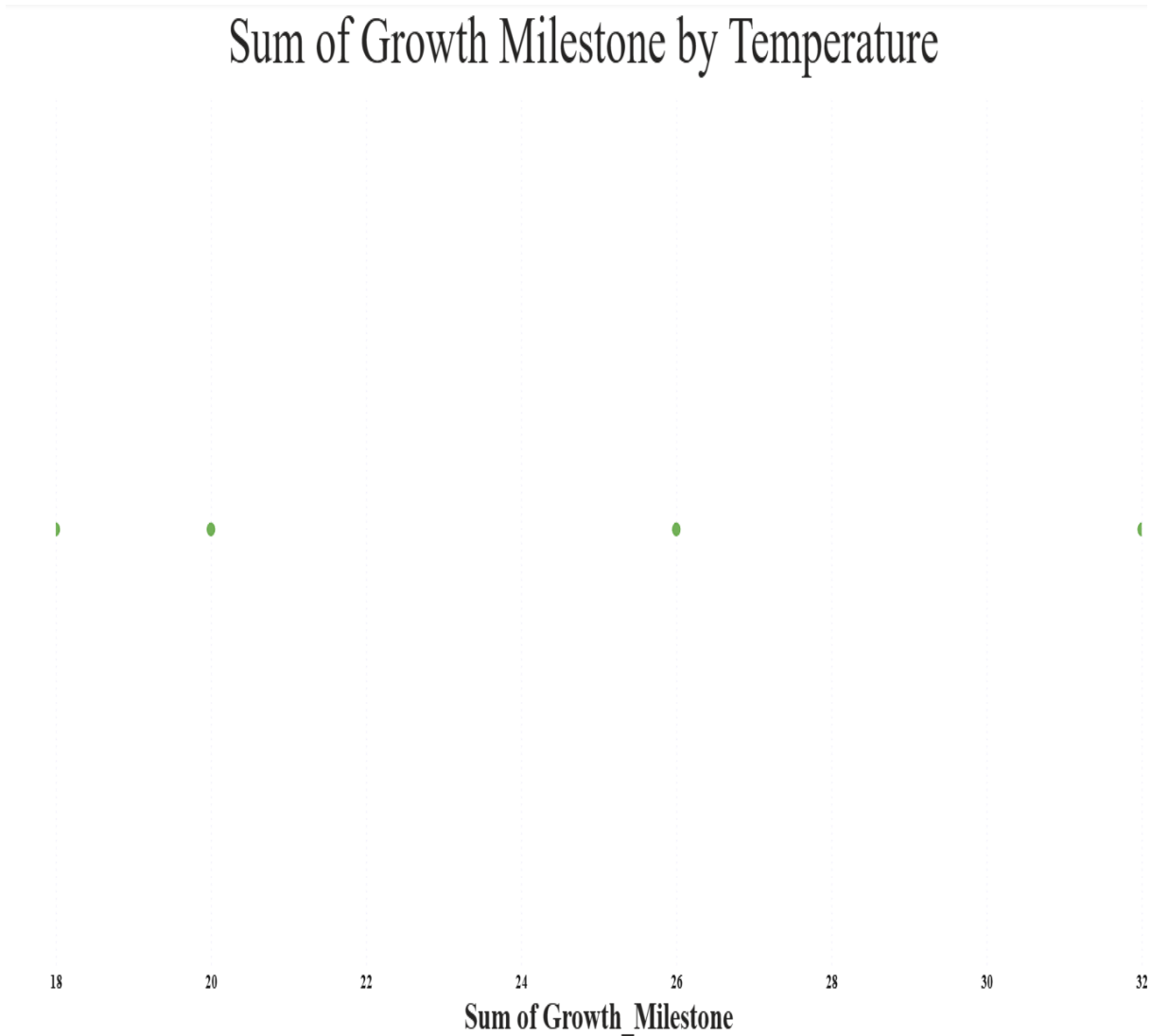
##### SCREENSHOT OF VISUALIZATION:



## 5. What is the ideal temperature range for plant success?

- **Visualization:** Scatter Plot (or Area Chart)
- **Description:** A plot with Temperature on the X-axis and Growth\_Milestone (Success/Failure) on the Y-axis (or colored by Legend), showing the cluster of successes between 20°C and 30°C.

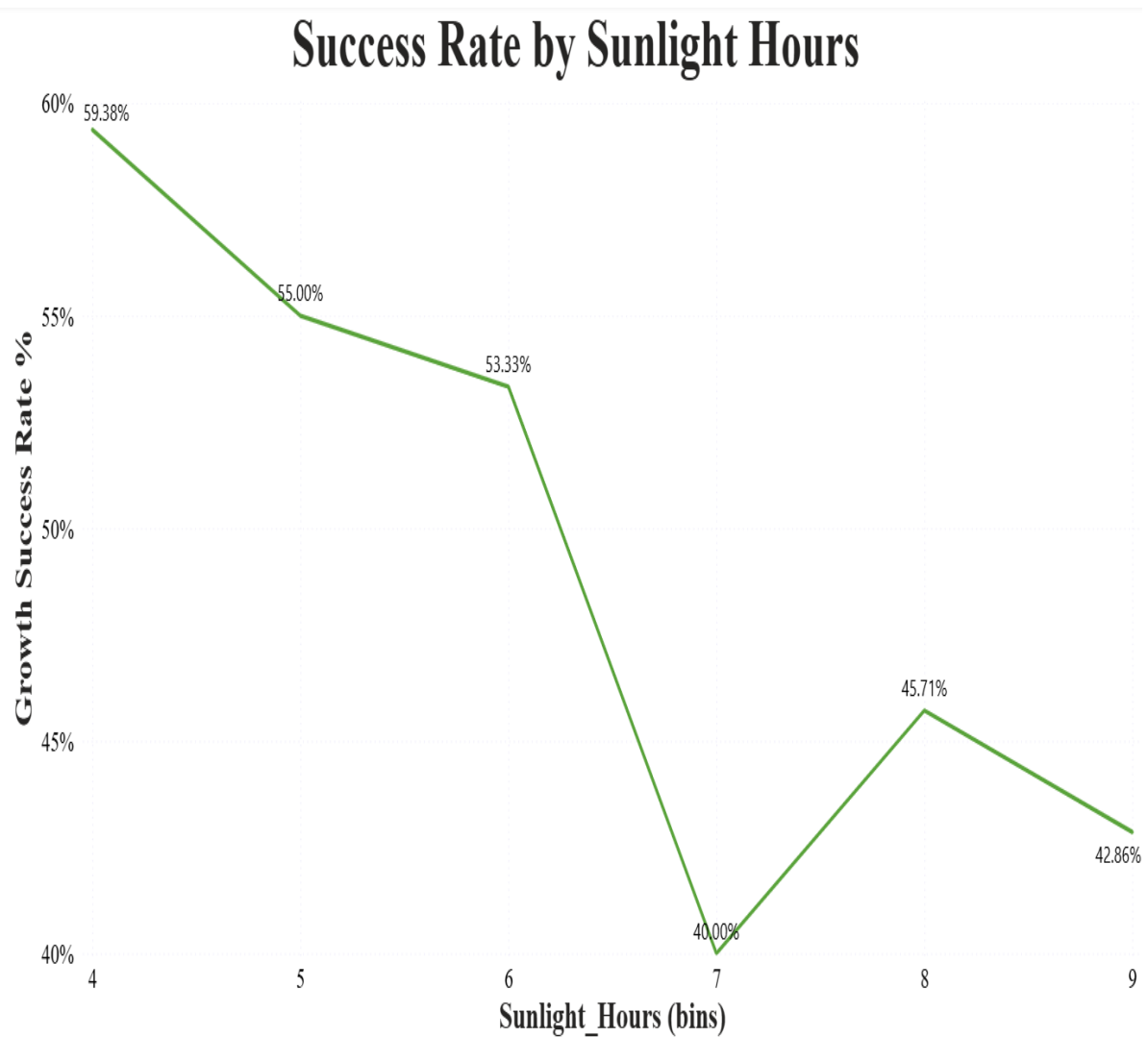
### SCREENSHOT OF VISUALIZATION:



## 6. Does the amount of sunlight received correlate with growth success?

- **Visualization:** Line Chart
- **Description:** A line chart showing the trend of average success rate as Sunlight\_Hours increases (binned into 1-hour groups).

### SCREENSHOT OF VISUALIZATION:



## 7. Which watering schedule works best for each soil type?

- **Visualization:** Matrix / Heatmap
- **Description:** A matrix table with Soil\_Type as rows and Water\_Frequency as columns, with the values indicating the "Success Rate %". This will highlight "Golden Rules" (e.g., Sandy + Daily = High Success).

### SCREENSHOT OF VISUALIZATION:

# Watering Schedule

Soil_Type	bi-weekly	daily	weekly	Total
clay	50.00%	42.11%	43.33%	44.78%
sandy	28.57%	51.43%	60.00%	48.44%
loam	57.14%	60.00%	50.00%	56.45%
<b>Total</b>	48.33%	51.35%	49.15%	49.74%

## 8. What are the humidity levels associated with failed crops?

- **Visualization:** Box Plot (or Histogram)
- **Description:** A visualization showing the distribution of Humidity for Successful vs. Failed plants to see if extreme humidity (too high or too low) is a common factor in failures.

### SCREENSHOT OF VISUALIZATION:

