

Comprehensive Analysis of Crop Yield, Soil, and Irrigation

Insights for Optimized Agricultural Practices

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Date - 3 October 2024

Overview

- **Objective:**
 - To analyze factors affecting crop yield.
 - To provide actionable insights for better resource management.
- **Key Focus Areas:**
 - Region-wise yield analysis.
 - Soil type influence on crop productivity.
 - Impact of irrigation and fertilizer on yield.
 - Weather and rainfall effects on yield.



Region-Wise Yield Analysis

- **Insights:**
 - North Region has the highest yields, especially for Barley and Cotton.
 - East and South Regions show lower median yields for crops like Soybean and Rice.
 - West Region has consistent but slightly lower yields for crops like Maize and Wheat.
- **Actionable Recommendations:**
 - Focus on improving agricultural practices in East and South Regions.
 - Share best practices from North Region for higher yields.



Soil Type Influence on Yield

- **Key Observations:**

- Loam Soil: Best yields across all regions and crops.
- Peaty Soil: High yields for Cotton, Rice, and Wheat.
- Sandy Soil: Performs well for Barley and Cotton but varies for other crops.
- Chalky Soil: Lower yields overall.
- Silt Soil: Stable but medium-range yields.

- **Recommendations:**

- Promote crop rotation strategies with Loam Soil.
- Use Peaty Soil for water-intensive crops like Rice.



Crop-Specific Insights

- **Observations by Crop:**
 - **Barley:** High yields in Loam and Sandy soils.
 - **Cotton:** Best performance in Loam and Peaty soils.
 - **Maize:** High yields in Sandy soil (East Region).
 - **Rice:** Better yields in Peaty and Loam soils.
 - **Soybean:** Consistent but lower yields.
 - **Wheat:** Optimal yields in Loam and Peaty soils.
- **Recommendations:**
 - Match crops with suitable soil types for maximum productivity.



Impact of Fertilizer and Irrigation

- **Key Findings:**
 - Fertilizer reduces days to harvest for all crops, especially Barley and Cotton.
 - Irrigation significantly boosts yield, especially in sunny conditions.
 - Combined use of fertilizer and irrigation maximizes yield and reduces variability.
- **Recommendations:**
 - Prioritize fertilizer and irrigation for crops like Maize, Cotton, Rice, and Soybean.
 - Develop policies to encourage combined resource use.



Weather and Yield Relationship

- **Observations:**
 - **Cloudy Weather:** Fertilizer improves yield from 4 to 6 tons/ha.
 - **Rainy Weather:** Fertilizer use shows smaller yield differences due to natural rainfall benefits.
 - **Sunny Weather:** Largest improvement with irrigation and fertilizer combined.
- **Recommendations:**
 - Focus on irrigation during sunny weather to stabilize yields.
 - Use fertilizer consistently, especially in cloudy and sunny conditions.



Rainfall and Fertilizer Interaction

- **Insights:**
 - Higher rainfall increases yield, especially with fertilizer use.
 - Without fertilizer, yield potential is capped even with sufficient rainfall.
- **Recommendations:**
 - Optimize rainfall and fertilizer usage to maximize yield.
 - Plan irrigation systems to complement natural rainfall patterns.



Final Conclusions

- **Key Takeaways:**
 - Fertilizer and irrigation are critical for improving yields.
 - Loam and Peaty soils are most productive.
 - Weather and rainfall management are essential for consistent crop performance.
- **Strategic Recommendations:**
 - Invest in irrigation infrastructure and fertilizer programs.
 - Match crop types with suitable soils and regions.
 - Develop regional agricultural policies based on insights.



Thank You! Questions and Discussions



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