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PRESENTS

OPTIMIZING AGRICULTURE PRODUCTION

THERE'S NO EXCUSE NOT TO DO
WHAT MAKES YOU HAPPY.

I.

RECENT FINDINGS

1. **Rice and Coconut need very high rainfall and humidity to grow,** Similarly cotton needs Nitrogen
2. Insights about Pesticides: **Pesticides should be avoided in Cotton, Banana, watermelon, muskmelon, Cotton, Coffee** because these need High Nitrogen content and Some organochlorine pesticides suppress nitrogen-fixing bacteria from replenishing natural nitrogen fertilizer in the soil, resulting in lower crop yields, stunted growth, and an ever-greater need for additives to boost production.
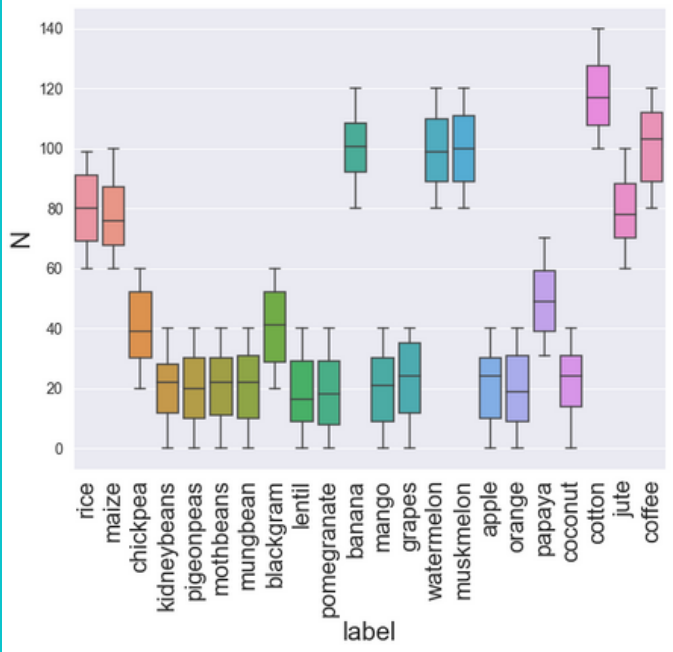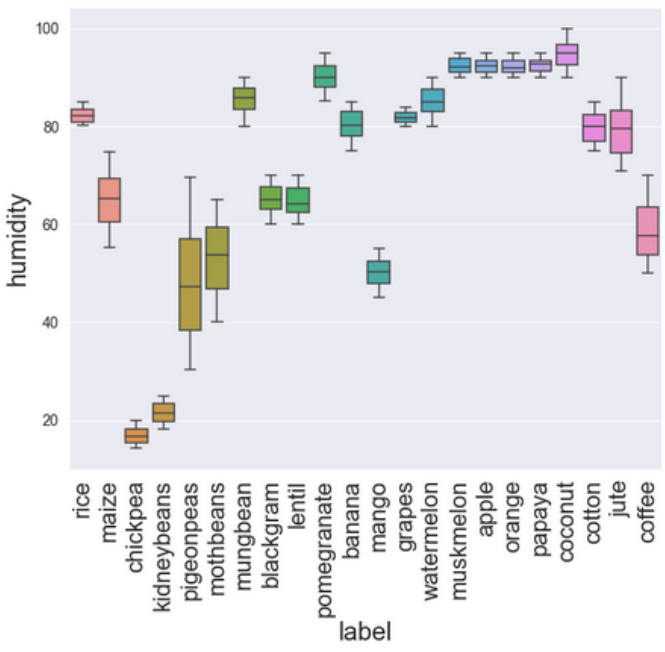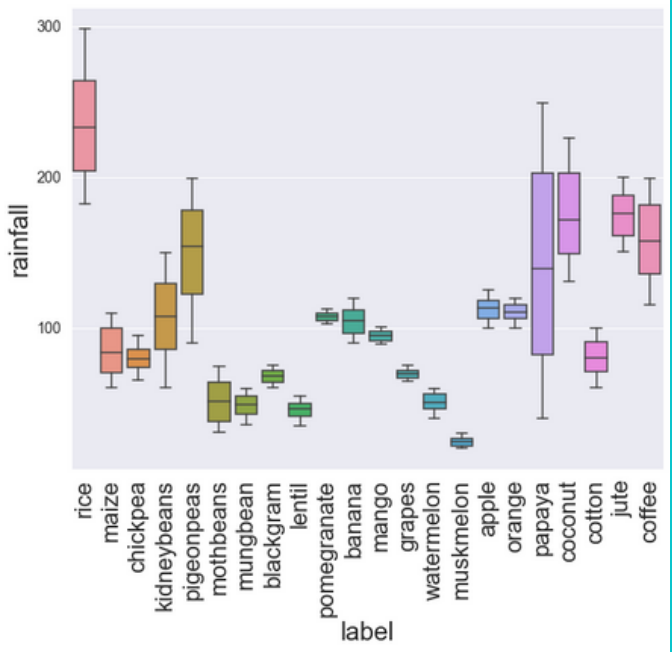
Very High Rainfall (200mm+)	Rice, Coconut
High (100- 200mm)	Kidneybeans, Pigeonpeas, Pomegranate, Banana, Apple, Orange, Jute, Coffee

Very High Humidity (80-100)	Rice, Mungbean, Pomegrenate, Banana, Grapes, Watermelon, Apple Orange, papaya, Coconut
High (60-80)	Maize, Blackgram, Lentil, jute, Coffee

Very High Nitrogen (90+)	Banana, watemelon, muskmelon, Cotton, Coffee
High (60-90)	Rice, Maize,jute

II. COMPANION PLANTING

With the application of Ml **Clustering Model using** Soil components (N,P,K) and environmental conditions data (Temperature, Humidity, pH, Rainfall) Findings suggest that we can grow **Four clusters** made up of different crops.

We end up with **soft clusters. I**n a business context, it is helpful as Sometimes we don't need a binary answer like in case of hard cluster ashaving different answers/combinations actually helps the business to have **multiple opportunities to grow**.

In the **order of significance**:
1. ['maize' 'chickpea' 'kidneybeans' 'pigeonpeas' 'mothbeans' 'mungbean','blackgram' 'lentil' 'pomegranate' 'mango' 'orange' 'papaya' 'coconut']
2. ['maize' 'banana' 'watermelon' 'muskmelon' 'papaya' 'cotton' 'coffee']
3. **['grapes' 'apple']**
4. ['rice' 'pigeonpeas' 'papaya' 'coconut' 'jute' 'coffee']

Business Benefits:
1. **Optimized costing of growing crops together**
2. **Easier sowing and caretaking of a cluster of crops**
3. **Soil and climate conditions can be managed easily for the clusters**

The Elbow Method

WCSS vs No. of Clusters

DO YOU KNOW WHICH CROP IS BEST SUITED FOR THE SOIL AND ENVIRONMENTAL CONDITIONS IN THE BAR GRAPH ?

MEASURE OF SUITABILITY

There's plenty of empirical data to support on which crop can be best grown on the basis of soil qualities and environment around the crops (Temperature, Humidity, pH, Rainfall) using the classification model with great accuracy.

Given the soil quality and environment around the crops, as shown in the bar graph, **Classification model** suggests that **Orange** is the most suitable crop for these conditions.