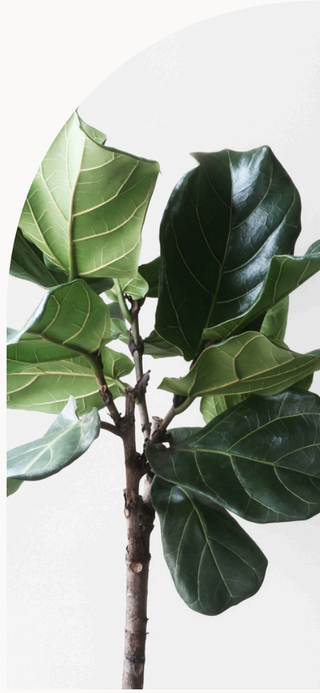

CROP-RECOMMENDATION SYSTEM

DATATHON 1.0 - DATATECH

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OBJECTIVE

To create intuitive tools and dashboards that empower farmers with actionable insights for informed decision-making in crop selection and soil management. Despite being one of the world's most critical industries, agriculture lags in leveraging data and intelligence for enhanced efficiency. With a growing global population and a declining agricultural workforce, it is crucial to sustainably increase farming output. Identifying and cultivating the right crops at the optimal location and time will be pivotal for achieving sustainable agricultural development in the coming years.

PROPOSED SOLUTION

- The predictive system defines the target for a model. After data cleaning the dataset will be split into training and test set. We are going to take the efficient algorithm and fit it to our model to make a crop prediction.
- This system helps farmers in agriculture. It helps in soil classification and suggest crop based on type of soil and weather conditions.
- This system helps farmers in agriculture. It helps in soil classification and suggest crop based on type of soil and weather conditions.

TECHNOLOGIES

Programming Languages: Python, SQL
Google Colab
Tableau

DATASET DESCRIPTION

Key Components:

1. Plant Varieties: Crop names, growth cycles, yield potential.
2. Soil Properties: pH levels, nutrient content (e.g., N, P, K), organic matter, salinity.
3. Climate Data: Rainfall, temperature ranges, humidity levels.
4. Water Requirements: Irrigation needs, drought tolerance.

DATASET CLEANING

1. Data Exploration - Inspected the database for table structures, data types, and relationships between tables. Identified key fields for the machine learning model, such as soil type, crop requirements, and climate factors.
2. Missing Data - removed the missing values and the null values from the dataset
3. Feature Engineering - Created derived columns like soil quality index: Aggregated metric based on nutrient levels, water Deficit Index: Ratio of rainfall to crop water requirements.
4. Normalization & Encoding - Scaled numeric fields (e.g., nutrient levels) to ensure consistency in model inputs. One-hot encoded categorical variables (e.g., soil type, crop variety).

PREDICTIVE MODEL

- The Random Forest algorithm is an ensemble learning method used for both classification and regression tasks.
- It works by constructing a multitude of decision trees during training and outputs the mode (classification) or mean (regression) prediction of the individual trees.
- In a predictive model for crop recommendation, Random Forest can be used to identify patterns and relationships between various agricultural features (like soil type, climate, and water availability) and crop varieties.
- By aggregating predictions from multiple trees, it provides a more accurate and stable prediction compared to individual decision trees.

VISUALIZATIONS

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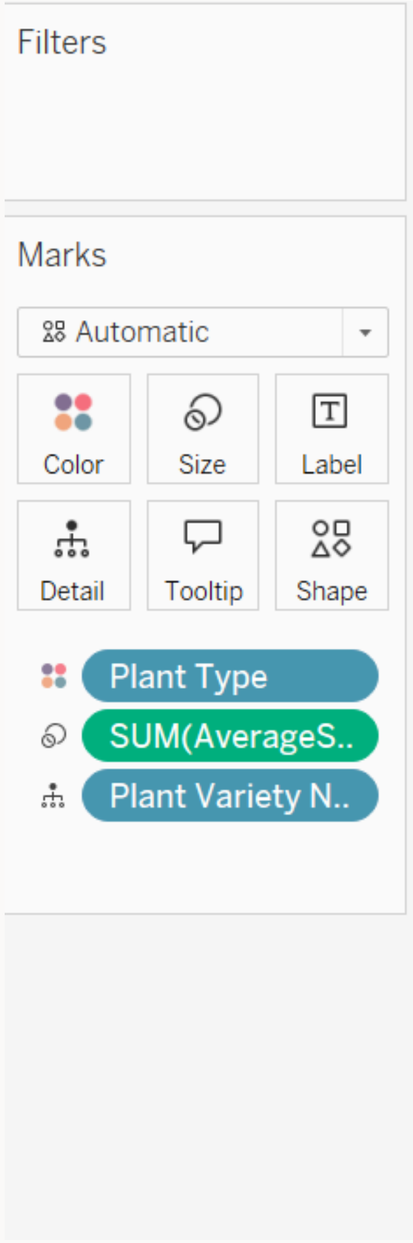

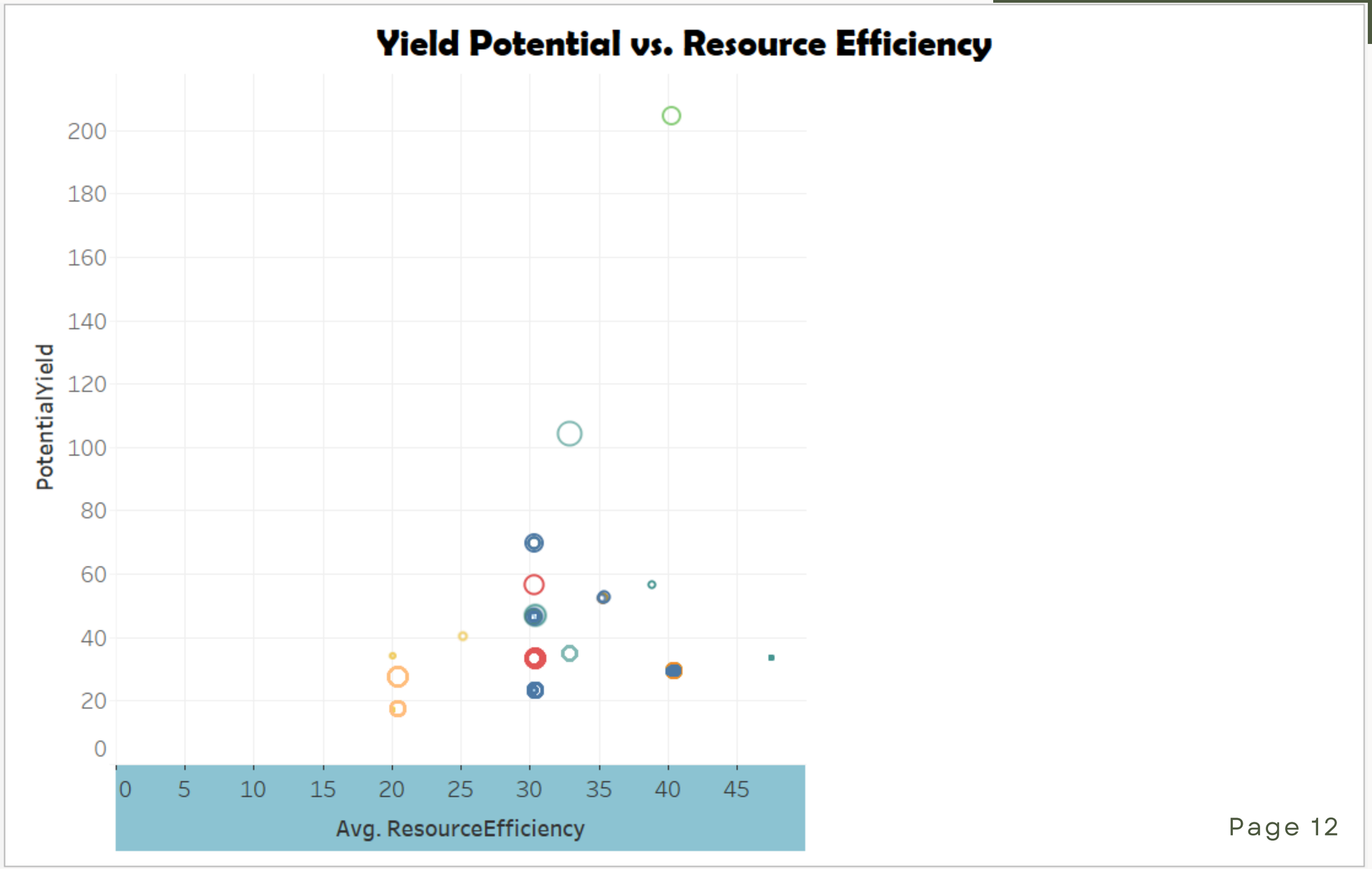

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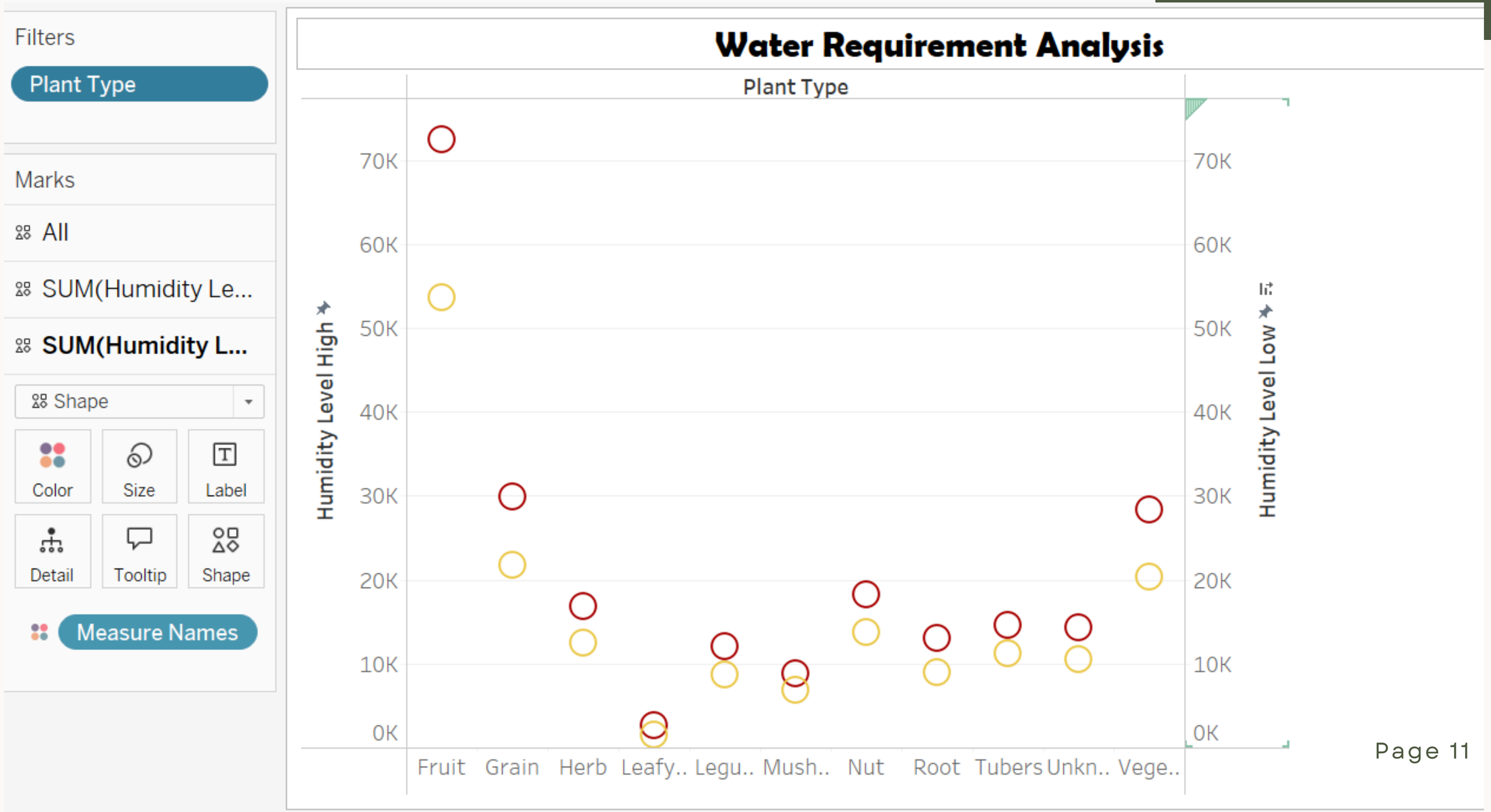

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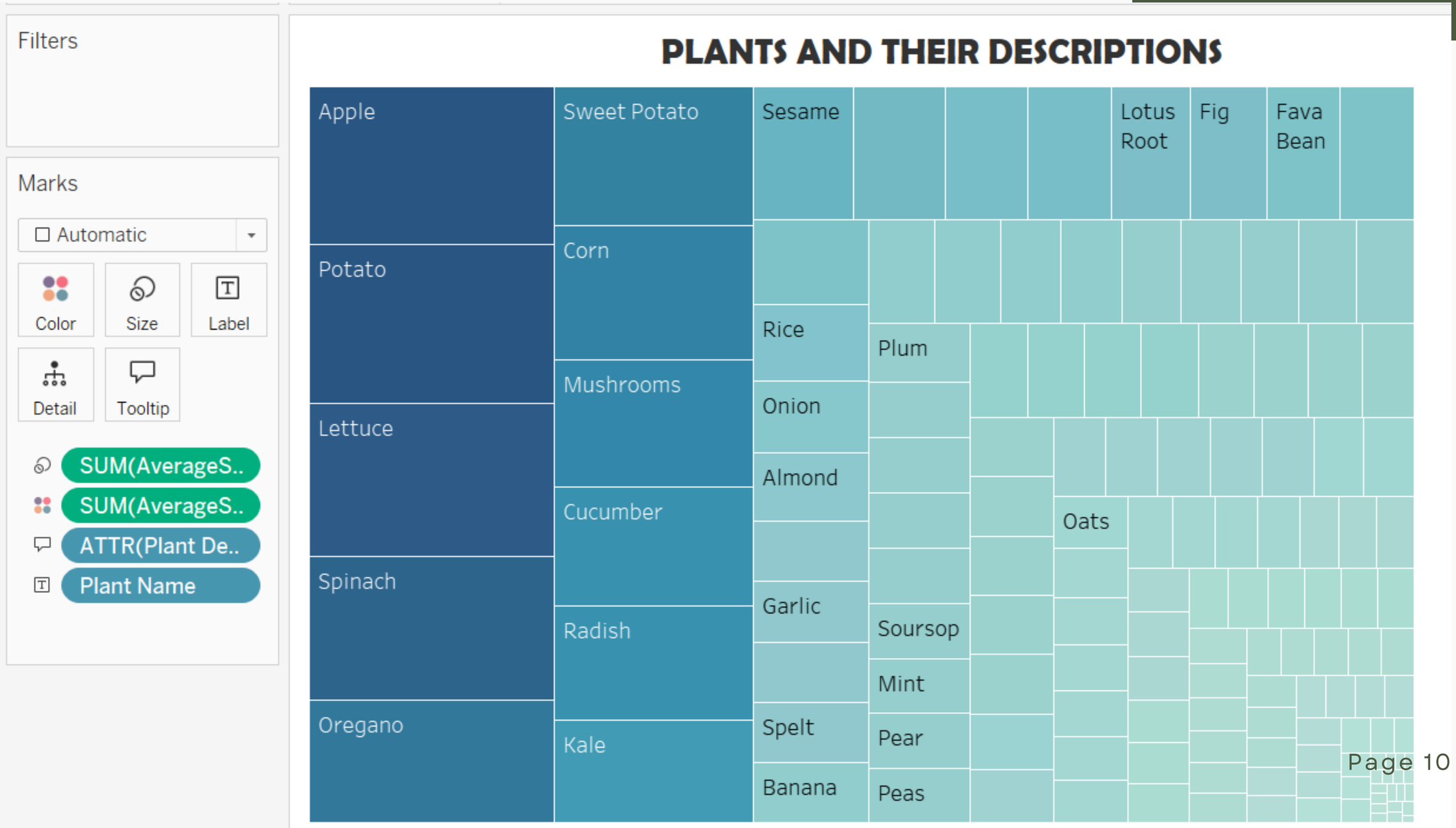

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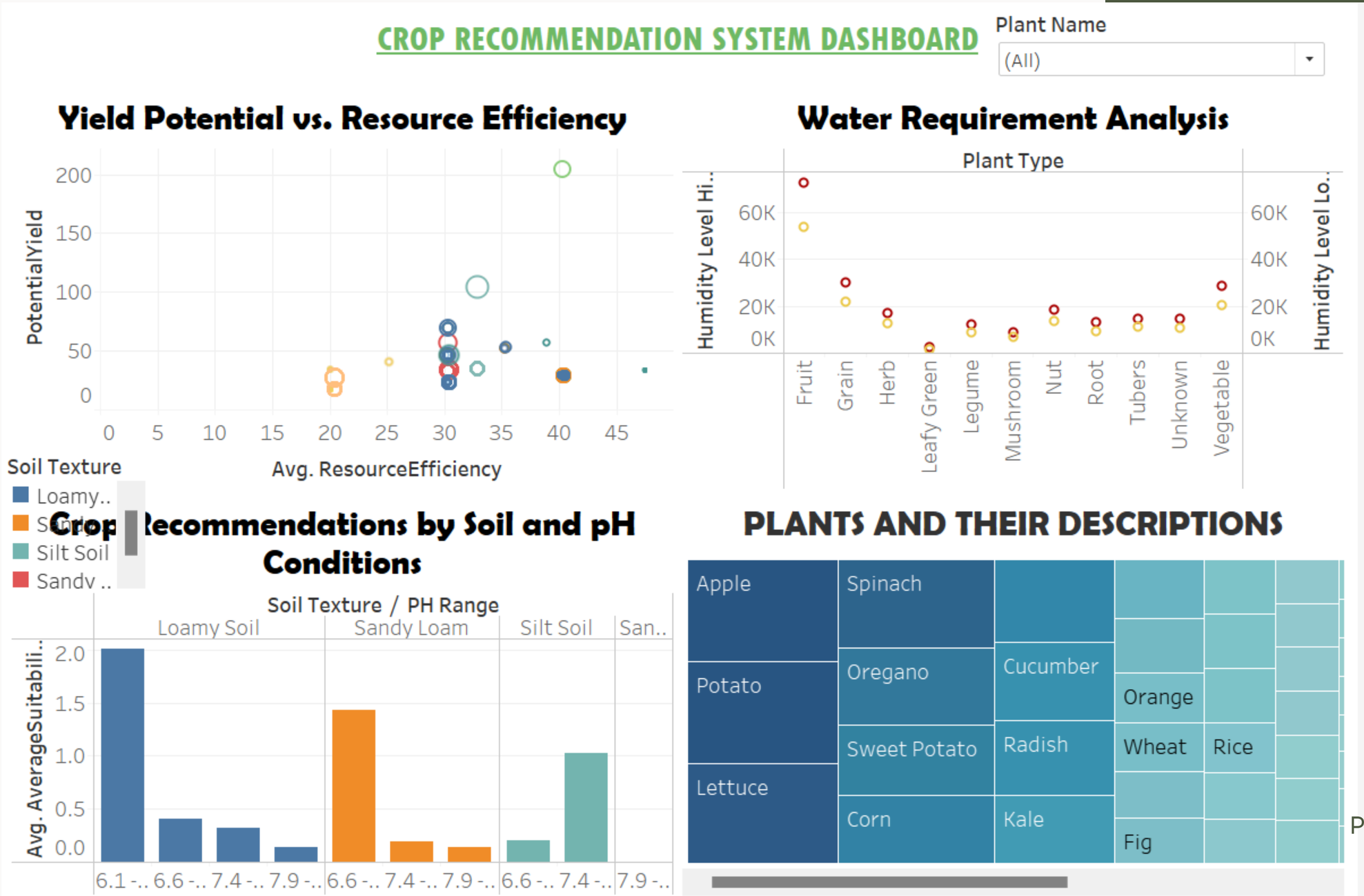

TEAMMATES

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02 ANANTHA VYASA KURUDI

03 MANI CHANDANA ALLE

ANY QUESTIONS?

THANK YOU!