INTRODUCTION

- Beck’s Hybrids develops and sells seed across the US
- Constantly developing new seed hybrids to perform better
- Part of development involves test plots for new variants
- Environmental factors can incur data and monetary losses
- Develop model for predicting least likely to be discarded plots
- Model based on public geospatial, soil, weather data

FUTURE GOALS

Machine Learning Goals
- Classify successful plots
- Merge geospatial, soil, weather data for training
- Early-stage Naïve Bayes model achieves 90% accuracy on classification
- Develop Logistic Regression Model for predicting percentage of success

App Development Goal
- Build Shiny app akin to soil data extraction app
- Deploy R Shiny app as a desktop app to mitigate internet usage
- Integrate Model Estimators for faster prediction
- Incorporate automatic email messaging
- Automatically generate land quality and success estimation report

METHODOLOGY

Geospatial Data
- Automated data collection and processing through TNM API
- Difficulties:
  - LIDAR data collection not standardized across states
  - US states do not have complete coverage of LIDAR data
  - API is not up to date and sometimes returns incorrect links

Soil Data
- Web Soil Survey and "FedData" for data collection, visualized with R Shiny and Leaflet applications
- Difficulties:
  - Managing large file sizes and file structures
  - Inconsistencies from data sources, outdated sources
  - Very slow to load data

Weather Data
- Collection of data through weather stations
- Analyzed data via graphing and descriptive statistics
- Difficulties:
  - Inconsistent public data
  - Weather station location bias
  - Predicting weather difficult in itself
  - Many variables to consider (rain, wind, disasters, etc.)

REFERENCES


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