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Masters Project

Predicting Pest Counts in the NH Corn Farms

Introduction

The goal of the project to develop a decent to machine learning method to predict the pest counts in the NH corn farms. We are interested in learning the population of the three types of pests: CEW, ECB, and FAW in the NH environmental condition. I was given the initial pest taps from the NH farms, and I employed Linear Regression and Poisson Regression Machine Learning Method to predict the pest count.

Data Mining and Data cleaning

Methods

1. Linear Regression

The first method I implemented to predict pest count is the Multiple linear regression model where tempf (temperature in ), dwpf (dew point temperature in ), drct (direction of wind/wind speed), and feel (windchill temperature ) are considered as the features (dependent variable). The pest trap count is considered as the dependent variable.

Multiple linear regression model can be defined as:

Where,

The predicted value can is defined as:

Where,

In the given the Multiple Linear Regression Model can be assumes as,

Experiment Results:

1. Poisson Regression

I implement Poisson Regression as the second method to predict the pest counts.

The Poisson Regression is based on Poisson distribution which can be modeled as shown in the equation 4 which is the log expected count model.

For an event,

Here,

Experiment Results;

Evaluations/Analysis

Conclusion

Resources

* <https://towardsdatascience.com/an-illustrated-guide-to-the-poisson-regression-model-50cccba15958>
* <https://data.princeton.edu/wws509/notes/c4.pdf>