

Pest Prediction on Orange Tree

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Abstract - This paper aims to predicting where Orange Tree's pests and diseases can occur, both now and in the future under different climate change scenarios, is a major challenge for orange tree's pest management. One solution is to estimate the fundamental thermal niche of the pest/disease to indicate where establishment is possible. An in-depth knowledge about variables affecting production is required in order to predict global production and take decisions in agriculture. Machine learning is a technique used in agricultural planning and precision agriculture. This paper classifies and introduces SVM Algorithm and describes some cases of their utilization.

Key Words:

SVM Algorithm, Linear Regression, Multiple Regression, HTML, JavaScript, CSS, python, SQL, notepad++, Environmental factors.

1. INTRODUCTION

This paper describes trends in work on methods of the prediction of Orange tree's pests using machine learning technology. It briefly introduces methods of using algorithms as SVM Algorithm, Multiple regression, linear regression and takes a look at various cases in which they have been used. Agriculture implies high levels of prediction risks and many variables must be considered to take decisions. A number of different insects and mites are common pests of citrus trees grown. Over the last few years have included various armoured and soft scale insects, mites, whiteflies, Leaf miners, mealybugs, and aphids. The most problematic pests for containerized citrus grown indoors over the winter are spider mites and mealybugs. Maintain good citrus tree health to reduce the chance and severity of scale infestation, and for the trees to better tolerate insect pests already present. Forecast for pests is an important component of the IPM (integrated pest management) strategy. Early warnings and forecasts based on bio physical methods provide lead time for managing impending pest attacks and can thus minimize crop loss, optimize pest control and reduce the cost of cultivation.

LITERATURE SURVEY

Pest Prediction using Machine Learning approaches proposed Linear Regression, SVM Algorithm and Multiple Regression to prediction of pests on orange trees. It briefly introduces methods of using algorithms as Multiple Regression, SVM and

takes a look at various cases in which they have been used. A number of different insects and mites are common pests of citrus trees grown. Over the last few years have included various soft scale insects, mites, whiteflies, Leaf miners, mealybugs, and aphids. The most problematic pests for containerized citrus grown indoors over the winter are spider mites and mealybugs. Maintain good citrus tree health to reduce the chance and severity of scale infestation, and for the trees to better tolerate insect pests already present. Forecast for pests is an important component of the IPM (integrated pest management) strategy. Early warnings and forecasts based on biophysical methods provide lead time for managing impending pest attacks and can thus minimize crop loss, optimize pest control and reduce the cost of cultivation. The quality and quantity of yields for many crop systems can be significantly reduced by pests and diseases. With the pressing need to understand the effects of climate change on food production, we provide a method to estimate and display the prediction of pest or disease. This System is the set of temperatures under which populations of a species would be expected to persist, all else being equal. It can be used to predict where pests or disease can currently establish outside of their existing range, as well as predict future locations of pest and disease outbreaks associated with a changing climate

Prediction of Orange tree using technical method:

1. Prediction of leaf moisture:

Younes Chtioui et al. [1] assume in their paper that leaf moisture is difficult for men to measure on their own, and has important influence on plant disease break-out. Their paper has analysed meteorological factors in predicting leaf moisture, and developed a SVM algorithm for predicting leaf moisture based on them. Their work was conducted by comparing the method of prediction via Multiple Linear Regression (MLR) and time (a unit of 24 hours), temperature, relative moisture, wind speed, solar radiation, precipitation, soil moisture indexes etc. were used as a training set and a data set. As a result of the experiment, the MLR has shown average absolute value prediction errors of 0.1414 for the test set and 0.1300 for the training set. Under the same condition, SVM Algorithm has shown average absolute value prediction errors of 0.0491 for the test set and 0.0894 for the training set. Consequently, it has been

confirmed that the SVM (Support Vector Machine) is more precise than the MLR (Multiple Linear Regression).

Proposed System:

The pests like citrus butterfly, leaf miner, blackfly, whitefly, etc. causes serious harm to orange tree, resulting in serious reduction of production. Therefore, rapid and accurate prediction of pest damage is the main method to make correct prevention measures and reduce insect pests. But many of these pest has developed resistance to many pesticides, we have to consider it too. The moto of this project is not only to predict pest but also to let farmer know about pest (characteristics and preventives measure for pest). In this project of Pest Prediction on Orange Tree we have proposed machine learning module which based Support Vector Machine Algorithm to predict pest based pest features and historical data. And that machine learning module will work on the web application platform. We are going to create a web site for Oranges and for its pests which carry information of oranges. The motive of this project is to create a web site on oranges and collect the needed data through the web site and provide the data to our machine learning module so that the machine learning module will process the given data and predict the output. And with the predicted output user can take necessary precaution to protect their orange trees. The main reason for creating the website is to provide information about pests. So that if anyone who use this system for their purpose will get knowledge about pests and its effects.

In this machine learning module:

- 1) We first get the data that contain all the necessary information that needed and store it using Pandas library.
- 2) Then we split the data in two form that is for training module and testing module. We split 75% data to train this machine learning module and 25% to test this module.
- 3) Then we plot each data item as a point in n dimensional space with the value of each feature being the value of a particular coordinate.
- 4) Then classify that data based on their feature into various classes.
- 5) Then, we perform classification by finding the hyper-plane that differentiates the classes needed very well.
- 6) In this way this module is completed and ready to predict pest.
- 7) Now, we take input from user like Current Month Average, Temperature etc. and from that input this module predict which pest may come on Orange Tree.

System Required:

1. HTML: HTML is the standard markup language for Web pages. With HTML you can create your own Website.

2. CSS: CSS is the language we use to style an HTML document. CSS describes how HTML elements should be displayed.

3. Notepad++.

4. Java Script.

5. Xampp.

6. PHP.

7. Python.

3. CONCLUSIONS

In this paper, we have proposed a Machine learning module that can predict the occurrence of future based on historical data including weather factors, orange tree morphology and Pests data, which is an important thing for the future prevention and control of pests and diseases and the development of agriculture. The neural network is a black box model, it does not need complex feature engineering, and we don't know which features might be useful for model training. In this paper we have discussed that we can predict the occurrence of future based on historical data including weather factors, orange tree morphology and Pests data, which is an important thing for the future prevention and control of pests with SVM algorithm only. We don't need such things like neural network which is very complex and hard to understand the concept. And the most important reason for doing this project is to make pest free environment for 'Orange Trees'. And for providing the knowledge of pests and its danger to the people.

REFERENCES

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