

Utilization of Pyphtopatholigcal data for Pathogen Forecasting

An Annotated Bibliography

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I pledge my honor that I have abided by the Stevens Honor System.

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1 Introduction:

I decided on plant pathology and disease forecasting because of its tremendous implications on human society. The production of food is essential to a functioning society, and disease forecasting models are used to ensure the steady and safe production of food. Moreover, the validation (or lack thereof) of forecasting models allows us to refine them and make them more accurate by comparing the models with actual data.

References

- [1] G. N. Agrios, “Plant Pathology,” 2005.

This book has comprehensive information on all aspects of plant pathology. This includes information pertaining to specific plant pathogens, as well as a brief look at the history of plant pathology. It should be noted, however, that the original intent of this book is that of a textbook, so some aspects may be simplified or abridged. As a result, this book will be cited

rarely and mostly in the context of establishing general basises.
For more specific data, other sources will be consulted.

- [2] G. C. Ainsworth, “Introduction to the History of Plant Pathology,” *Cambridge University Press*, 1981.

This book provides a wide variety of information regarding the history of plant pathology. This includes its origins, with Theophrastus in Ancient Greece, to the early 18th and 19th century innovations, up to the most recent innovations in the 20th century. Its use in this paper will be in the explanation of the history of plant pathology, as it contains such a large volume of information on the topic. As a result, it will be used mostly in the introductory sections to provide context.

- [3] M. Ashrafuzzaman, “History of Plant Pathology,” 2013.

This presentation was compiled by Professor Ashrafuzzaman at Oregon State University as a summary of the history of plant pathology. Therefore, it will be used primarily to establish historical context, as it provides a plethora of information regarding important historical figures and timelines. As a result, this source will be used to describe important dates of discoveries and historical figures.

- [4] T. Caffi and V. Rossi, “Fungicide models are key components of multiple modelling approaches for decision-making in crop protection,” *Phytopathologia Mediterranea*, vol. 57, no. 1, pp. 153–169, 2018.

This article, published in 2018, details the different ways plant diseases can be modeled. Including aspects such as needed variables, and the general chain of plant infection and spread. This article is incredibly useful in how it explains how plant diseases spread in the environment, most notably through its use of graphs and charts. This article will be used in this paper as a source for relevant figures to describe pathogen spread and forecasting models.

- [5] M. U. Charaya, A. Upadhyay, H. P. Bhati, and A. Kumar, “Plant Disease Forecasting: Past Practices to Emerging Technologies,” 2021.

In this article by Charaya, Upadhyay, Bhati, and Kumar, the history of plant disease forecasting is summarized succinctly. Explaining historical forecasting models and how they have progressed, the authors dutifully demonstrate the efficacy and importance of accurate forecasting models. Furthermore, this article recent publishing indicates data that is relevant to today. In this paper, this article will be used to give context to both the history of plant disease forecasting, as well as the basics of how they work, and how they impact society and the economy of the planet.

- [6] J. M. C. Fernandes, W. Pavan, and R. M. Sanhueza, “Sisalert-a generic web-based plant disease forecasting system.” pp. 225–233, 2011.

This article explores the potential benefits of using web-based modeling systems to predict the spread of plant disease. Published over 10 years ago, this source is incredibly useful as it showcases the beginning of internet-based models, a practice that has become much more common recently. Not only does it talk about the creation of these models, but also the benefits it can provide on food production worldwide. Thus, this article will be used to cite the incredible benefits of an effective plant disease modeling system.

- [7] Theophrastus and A. Hort, “Enquiry Into Plants and Minor Works on Odours and Weather Signs (Vol. 1-5),” 1916.

This book is the first known publishing of plant pathology in human history. Originally published in Ancient Greece by Theophrastus, Enquiry into Plants offers the most in-depth view of how plant diseases were understood and studied in ancient civilizations. The version we are using has been translated and republished by Arthur Hort in 1916. The uses of the book in the context of this paper is historical, in order to showcase the progression of plant pathology from the beginning to modern times. Also, this book will be used to give general examples for ancient Greek plant pathological studies.

- [8] USPEST.org, “<https://uspest.org/risk/models>,” 2022.

This website is a database containing several plant disease forecasting models. These models are based in the United States, and there are several models for each pathogen. Not only are the graphs of these models shown, but the source code as well. Thus, this website is very useful for learning how to create one's own forecasting model. The primary use of this source is to acquire reference graphs and the necessary steps in how to create a forecasting system from scratch, based off of the models present in this source. This source also provides necessary weather and humidity data for disease modeling.