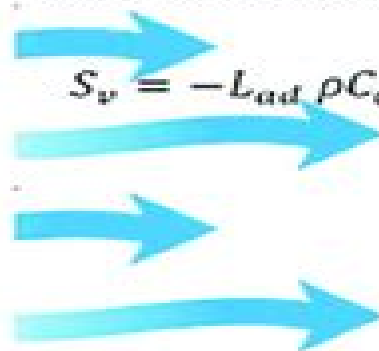


Plant resistance to air



$$S_v = -L_{ad} \rho C_d v^2$$



Crop

Heat and water vapor balance

$$G_{abs} = Q_{sen} + Q_{lat}$$

$$Q_{sen} = I_{LAP} C_p (T_l - T_a) / r_a$$

$$Q_{lat} = \lambda I_{LAP} C_p (\omega_i - \omega_a) / (r_a + r_s)$$

Crop Modeling

Heat and Water vapor balance

$$G_{abs} = Q_{sen} + Q_{lat}$$
$$Q_{sen} = I_{LAP} C_p (T_l - T_a) / r_a$$
$$Q_{lat} = \lambda I_{LAP} C_p (\omega_i - \omega_a) / (r_a + r_s)$$

Heat and Vapor source in crop volume

Friction and Momentum Sink

$L_{ad}$   $C_D$  from [55]

$$S_v = -L_{ad} \rho C_d v^2$$

Momentum sink in crop volume

Computational 3D model

$\rho, v$

$S_v$

# Advances In Plant Pathology Mathematical Modeling Of Crop Disease

**D.G. Jones**



## **Advances In Plant Pathology Mathematical Modeling Of Crop Disease:**

**Advances in Plant Pathology** C.A. Gillian,1986      **Mathematical Modelling of Crop Disease** Christopher A. Gilligan,1985  
Advances in Plant Pathology is a new series designed to be flexible in its thorough coverage of the field The volumes concentrate on ideas and interpretations and are controversial when appropriate The audience is intended to be wide and diverse and to include undergraduates graduate students researchers faculty and research agronomists

Advance in Plant Pathology Vol 3: Mathematical Modelling Or Crop Disease C.A. Gilligan,1985      **Epidemics of Plant Diseases** Jürgen Kranz,2012-12-06  
In this volume experts present the latest status of mathematical and statistical methods in use for the analysis and modeling of plant disease epidemics Topics treated are methods in multivariate analyses ordination and classification modeling of temporal and spatial aspects of air and soilborne diseases methods to analyse and describe competition among subpopulations e g pathogen races and their interaction with resistance genes of host plants assemblage and use of models mathematical simulation of epidemics New chapters on the modeling of the spreading of diseases in air and in soil are included in this second edition      *Experimental Techniques in Plant Disease Epidemiology* Jürgen Kranz,Joseph Rotem,2012-12-06  
Most books on epidemiology have treated the subject from a statistical mathematical or computer applicational point of view However experiments must be performed first to provide the data for models which in turn can then be proven by further experimentation This mutual interplay of theory and empirics gives epidemiology its scientific thrust and charm This book provides a choice of methods for varying applications and objectives covering all important aspects for the designing of experiments Furthermore the reader is supplied with solutions to his experimental problems and many tricks of the trade The newcomer to the field will also profit by this methodology guide      **Plant Disease Epidemiology: Facing Challenges of the 21st Century** S. Savary,B.M. Cooke,2007-12-13  
Plant disease epidemiologists have a strong scientific tradition in studying climate pathogen disease relationships Biodiversity is also of global concern The decline of global biodiversity that is currently taking place has been referred to as the sixth great extinction process our planet has experienced during its history but this time it is man made Generations of plant pathologists and especially of plant disease epidemiologists have been dealing with biodiversity It is from this diversity that presumably the most potent instrument for disease management has been developed by plant pathologists host plant resistance Host plant diversity and the disease resistance genes it harbours can be deployed over time and space according to epidemiological principles Sustainable production and protection systems also need to be devised which could exploit scarcer resources sparingly and if possible enhance the resource base Plant disease epidemiologists alone cannot provide answers to such questions but certainly could significantly contribute to these new strategies This book provides an overview of some of the latest research in plant disease epidemiology from researchers at the cutting edge of this important discipline  
*The Epidemiology of Plant Diseases* B. Michael Cooke,D. Gareth Jones,Bernard Kaye,2006-06-18  
Plant disease

epidemiology is a dynamic science that forms an essential part of the study of plant pathology. This book brings together a team of 35 international experts. Each chapter deals with an essential component of the subject and allows the reader to fully understand how each exerts its influence on the progress of pathogen populations in plant populations over a defined time scale. Since the first edition of the text was published in 1998, many new developments have occurred in the subjects covered, particularly molecular diagnostics, modelling, fungicide resistance, and information technology. The second edition of the book is a comprehensive text on all aspects of plant disease epidemiology that should serve as an invaluable reference work for those involved in this fascinating science of crop plants.

The Epidemiology of Plant Diseases D.G. Jones, 2013-03-09

Most branches of science have what might be termed a core area which is both related to and helps to integrate peripheral topics to form the overall subject area. Without this central link, the subject is simply a collection of disparate, albeit generally related topics. What genetics is to plant breeding, epidemiology is to the subject of plant pathology, and no matter what individual topic is considered, it is always possible to recognize the interaction with and relationship to epidemiological factors. Broadly speaking, until the 1950s, plant pathology was considered as the applied side of mycology, and indeed the British Society of Plant Pathology was spawned from its mentor, the British Mycological Society, with considerable help from The Association of Applied Biology. However, with the exploding world population and the growing demand for food, plant pathologists became increasingly aware of the need for a more considered, measured, precise, and even holistic approach to their subject, and particularly to plant disease management. Looking back over 40 years of teaching and research in plant pathology, it was very clear that the core of the subject was epidemiology, and that this new study was developing a very distinct identity which was rapidly being recognized in its own right. The shotgun approach to plant disease control was quickly perceived to be too inexact, and almost every aspect of the subject was being reviewed, refined, and advanced.

**The Study of Plant Disease Epidemics** Laurence V. Madden, Gareth Hughes, Frank van den Bosch, 2007

Plant disease epidemics caused by established and invasive pathogen species continue to impact a world increasingly concerned with the quantity and quality of its primary food supply. The Study of Plant Disease Epidemics is a comprehensive manual that introduces readers to the essential principles and concepts of plant disease epidemiology.

Plant Disease Epidemiology: Population dynamics and management Kurt J. Leonard, 1986

**Introduction to Plant Disease Epidemiology** C. Lee Campbell, Laurence V. Madden, 1990-01-16

Development of plant disease epidemiology, monitoring epidemics, host environment, pathogen, and disease modeling and data analysis, temporal analysis of epidemics, description and comparison of disease progress curves, and advanced topics. Spatial aspects of plant disease epidemics: dispersal, gradients, and long range transport, and analysis of spatial pattern simulation models of plant diseases, designing experiments, and sampling crop loss assessment and modeling and forecasting plant disease.

**The Art and Craft of Modelling in Applied Biology**, 1991

Rice Blast Modeling and Forecasting International Rice Research Institute, 1991

**Spatial Components of Plant**

**Disease Epidemics** Michael J. Jeger, 1989      **Scientific Horticulture** ,1983      **Journal of the University College of Wales, Agricultural Department** University College of Wales (Aberystwyth, Wales) Agricultural Society, 1983      **The Journal of the Agricultural Society** ,1983      Modelling in Applied Biology ,1996      Epidemics of Plant Diseases Jürgen Kranz, 1990-09-10 In this volume experts present the latest status of mathematical and statistical methods in use for the analysis and modeling of plant disease epidemics Topics treated are methods in multivariate analyses ordination and classification modeling of temporal and spatial aspects of air and soilborne diseases methods to analyse and describe competition among subpopulations e g pathogen races and their interaction with resistance genes of host plants assemblage and use of models mathematical simulation of epidemics New chapters on the modeling of the spreading of diseases in air and in soil are included in this second edition      Epidemics of Plant Diseases Jürgen Kranz, 1990-09-10 In this volume experts present the latest status of mathematical and statistical methods in use for the analysis and modeling of plant disease epidemics Topics treated are methods in multivariate analyses ordination and classification modeling of temporal and spatial aspects of air and soilborne diseases methods to analyse and describe competition among subpopulations e g pathogen races and their interaction with resistance genes of host plants assemblage and use of models mathematical simulation of epidemics New chapters on the modeling of the spreading of diseases in air and in soil are included in this second edition

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