

Feature Articles**Application of Statistical Methods in Epidemiology
of Rice Diseases in Taiwan**Yih-tyang Huang¹⁾ and Tea-yuen Huang²⁾**Summary**

Epidemiology is the science of populations; the study of the development and spread of disease as well as disease forecasting and management. In Taiwan, statistical methods have been used to study the disease epidemiology of rice leaf blast since 1979. In development of disease forecasting models for rice leaf blast, the infection rate was calculated based on the Gompertz growth model; key climatic variables were selected by the principle component analysis; and models were developed by the correlation and regression analysis. In evaluation of fungicides for controlling leaf blast of rice, the Monomolecular, Richards, Gompertz and Logistic models were used to describe the progress of disease; Duncan's multiple range test was employed to determine the difference between infection rate, AUDPC and disease severity as the parameters for fungicide evaluation. In the spatial pattern analysis of rice leaf blast, Rook and Moran's I statistic, and spatial lag autocorrelation methods were used to test randomness of disease. Three-dimensional mapping method and disease gradient analysis were used to determine the disease focus and direction of disease spread. In the study of epidemiology of bacterial leaf blast, the Monomolecular, Logistic, Gompertz and Richard models were used to depict the progress of disease; Kruskal-wallis H ANOVA Test employed to compare the disease incidence at different sites of the same basin to proximity of source of water; and correlation and regression methods were used to build up the forecasting models.

Key words: Statistical methods, Application, Epidemiology, Rice disease.

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