
Detecting the emergence or elimination of infectious diseases in annual crop systems

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Résumé

Many ecosystems exhibit critical transitions where system dynamics shift abruptly to a qualitatively different state. *Early warning signals* (EWS) can anticipate such events in models that display a local bifurcation. While conventional compartmental models show transcritical bifurcations linked to the basic reproduction number, annual plant epidemic models differ due to seasonal events. We adapt EWS to this context using a multi-season reproduction number to forecast epidemic emergence or elimination, highlighting potential implications for real agricultural systems.

Mots-Clés: infectious epidemiology, polyetic epidemics, statistical indicators, agriculture

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