CBGP
Centre de Biologie pour la Gestion des Populations

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Grande salle + visio

FORECASTING THE RISK OF LOCUST OUTBREAK

par
Lucile Marescot, CIRAD-CBGP

- Locusts are among the most dreadful agricultural pest in the world. Capable of adjusting their behaviour, morphology, and physiology in response to population density, these insects, when they reach the gregarious phase, can unite in massive swarms spanning hundreds of square kilometres. This phenomenon inflicts considerable harm to crops and the environment and may jeopardizes food security across many Southern countries.

- To manage this pest, preventive measures are taken to assess the risk of an upsurge in local abundance and take early action. In this context, machine learning algorithms are being used to predict desert locust distribution, especially the aggregation of individuals in the solitarious/transient phase and regularly provide an update in occurrence maps using satellite data on climatic and habitat conditions. This iterative process may help orientating the teams in the field for surveillance purpose. During critical situations, when locust swarms are already in motion, proactive management requires a better understanding of ecological and socioeconomical processes at a global scale. In such circumstances, employing mechanistic models like agent-based models can aid in predicting the locations, timing, and severity of the impact on agriculture and other economic sectors. This approach can enable a more accurate assessment of the international funding and logistical requirements needed to effectively control an upcoming plague.

- In this talk, I will discuss these two existing approaches currently employed to forecast the risks associated with locust demographic and spatial expansions. I will provide two examples: one involving the use of random forest to forecast the risk of desert locust occurrence in West and North Africa, and another using an agent-based model to predict the risk of Senegalese grasshopper population outbreaks under various agricultural practices. I will assess the effectiveness of these methodologies to be turned into operational tools, identify the gaps hindering decision-support systems and provide perspectives to address them.

- Exposé en anglais, l'oratrice est francophone