IMPACT OF CLIMATE CHANGE ON BIODIVERSITY - A GLOBAL PERSPECTIVE

The Role of Climate Change in Insect Pest Resurgence

T2_P_S12

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INTRODUCTION

Historically, climate change has been a key factor influencing agriculture. The same factors have also intensified insect pest resurgence, threatening crop yields. Here, we examine the impacts of climate change on pest outbreaks and plausible solutions to tackle them.

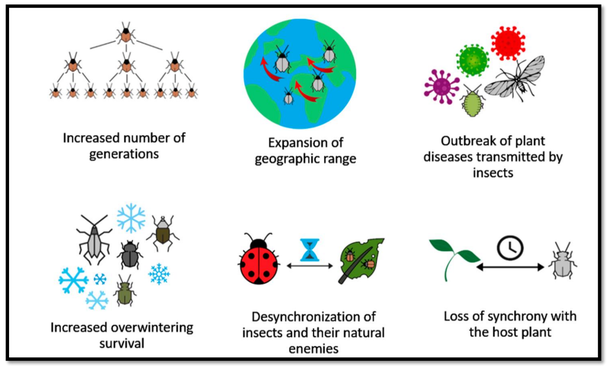

Fig. 1: Graphical Abstract [3]

OBJECTIVES

- Examine how rising temperatures, increased levels of CO_2 changing precipitation and other climatic parameters affect pest dynamics and crop interactions.
- Identify mathematical model-based tools that can be used to predict pest outbreak
- Propose IPM strategies and emphasise ongoing monitoring and research.

METHODOLOGY

A literature review was conducted using databases like PubMed, Google Scholar, etc., focusing on the impacts of climate change on agricultural insect pests. Key effects of changes in climatic parameters such as temperature, humidity, and precipitation were analyzed thematically to understand pest dynamics and identify solutions to the proposed problems.

RESULTS AND DISCUSSION

1. **Temperature Increases:** Accelerate pest life cycles and expand their geographic ranges.
2. **Elevated CO_2:** Alters plant defenses, leading to increased pest herbivory.
3. **Changing Precipitation:** Affects pest survival and reproduction; flooding and droughts have complex impacts.
4. **Crop Damage:** Enhanced pest activity threatens yields, affecting food security.
5. **Pest Management:** Requires updated strategies to address climate-induced changes.

OUTCOMES

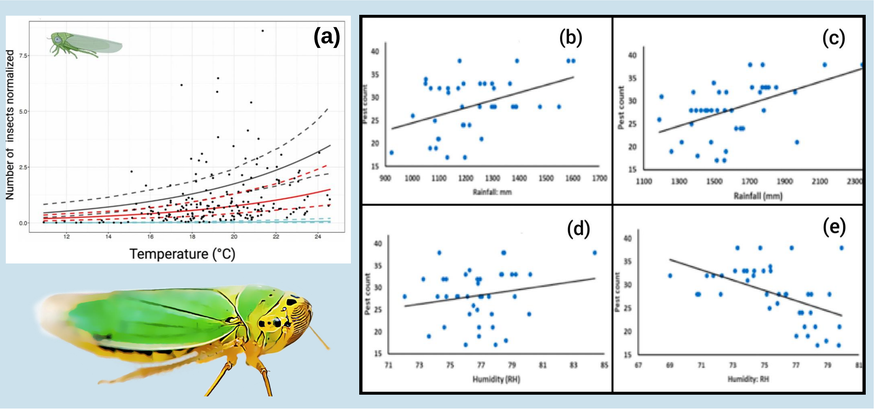

Fig. 2: Climate Change and Corresponding Pest Activity Relationship with (A): Temperature[2] [(Black line is the median; T°C = mean daily temperature (°C)] (B) & (C): Humidity [1], (D) & (E): Rainfall [1]

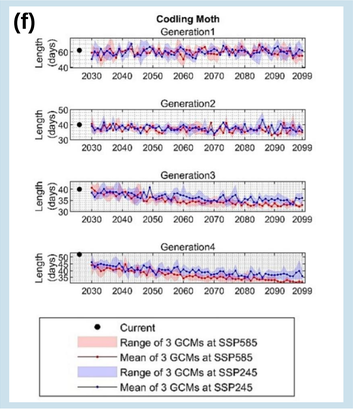

Fig. 3: Geographic Climatic Models (GCMs) show shifts in codling moth (*Cydia pomonella)* populations over time

CONCLUSION

Long-term pest monitoring is crucial to understanding and predicting climate change impacts in devising Integrated Pest Management strategies [3]. Integrated Pest Management strategies should be subjected to regular scrutiny aimed at improvisation. Modelling tools like correlative and mechanistic species distribution models (e.g., MaxEnt, CLIMEX) can be used to predict pest distribution changes to take necessary actions.

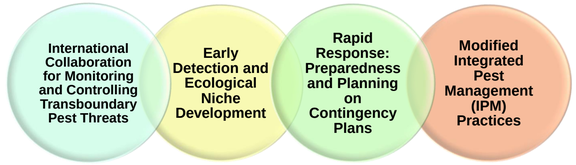

Fig. 4: Protocol for effective management[3]

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