Application, Needs and Case study of Climate Data for Rice Farmers

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Introduction

- Agriculture is definitely the most climate-sensitive sector because of its close association with temperature and precipitation.

- Rice production is influenced directly and indirectly.

- The cropping pattern for rice was determined by our weather and climatic conditions.
Application of climate data

- Proper dry land preparation.
- Long sunshine hours during the reproductive growth phase.
- Determine the conduciveness of a location for disease development.
- Indicate or predict insect pest populations.
Need of climate data

- Climate data is extremely important for developing forecasting models, either for disease or insect pest outbreaks and should be taken over an extended period (≥ 5 years, without missing data).
Case study: The influence of weather on the population dynamics of the rice stink bug and the implications for integrated pest management (Sutherland and Baharally, 2003)

- Developing pest management strategies require detailed knowledge of the influence of abiotic factors on the biology of pest insects.

- Weather and climatic conditions are known to significantly affect the population dynamics of insect pests.

- Knowledge of temperature, day-length, rainfall and RH can be used as important components in forecasting and predicting the severity of insect pest populations.
In tropical agro-ecosystems, temperature and day-length tend to be relatively stable throughout the year.

Humidity and rainfall exert a greater influence over the population dynamics of herbivorous insects.

The paddy bug, Oebalus spp is a major insect pest of rice.
Impact of paddy bugs on rice production
Sterile grains reduce yield
Damaged grains reduce quality
Materials and methods

- Weekly sweep-net samples were taken from fields and their associated levees at the Rice Research Station, Burma.

- Six (6) seasons (June 1999 to June 2002).
- Levees were predominantly covered with grassy species.
- Sampling commenced 6 weeks after sowing and continued through to harvest.
- 100 consecutive sweeps, with at least 10m from the edge in the fields.
Results and Discussion
Mean no. of O. poecilus/100 sweeps/week

Weekly rainfall (mm)

e) autumn crop 2001
Conclusion

- Oebalus spp. population on the levees can be used as an ‘early warning device’.

- Weekly rainfall data can be used in conjunction with numbers of bugs from levees to predict the severity of the pest population.

- Such information is essential for effective Integrated Pest Management:
  - Targeted vs calendar spraying
  - Improve cultural practices
  - Conserve and/or enhance biological control agents
  - Reduce pesticide use.
The impact of climate change for insect pest management

- Global warming and climate change will have serious consequences on diversity and abundance, as well as, the extent of losses due to insect pests.

- There may be the possibility of evolutionary adaption in insects for a changing environment.

- Prediction of changes in geographical distribution and population dynamics of insect pests will change.
Pest outbreaks might occur more frequently, particularly during extended periods of drought, followed by heavy rainfall.

Some of the components of pest management such as bio-pesticides, natural enemies, and synthetic chemicals will become less effective as a result of increase in temperatures and UV radiation, and decrease in relative humidity.
THANK YOU