



INFLUENCE OF WEATHER ON PEST AND DISEASES OF CROPS

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ABSTRACT

In the tropics and sub tropics areas every year considerable crop loss occurs due to pest and diseases. The weather conditions acts as triggering factors for the periodic or seasonal incidence and outbreaks of pest and diseases. The pest and disease attack increases on host plants under complimentary environmental conditions, it was difficult to understand the system and warn before the further increase of pest and disease attack unless combined effects are made to make a good data base. Different models like linear and non linear regression models, logistic models, and computer-based simulation models are being used from the past few years. Particularly in India, the forewarning and early warning models are mostly in budding stage despite of few models availability. An invention of new path for predicting the occurrence of pest and diseases with relatable accuracy can be a boon to prevent losses due to pest and disease incidences.

INTRODUCTION

In areas of tropics and sub tropics there was a considerable crop loss every year due to pest and diseases. These are the main reasons for the geographical distributions and restrictions on productivity for plants and animals. The weather conditions acts as triggering factors for the periodic or seasonal incidence and outbreaks of pest and diseases. These widespread of diseases are primarily weather dependent either in the from the local weather conditions that are suitable for growth and development of contributively organism and also the existing winds that favourable for spreading of airborne pathogens or spores like rusts, mildews, scabs and blights. The following study explains the effect of weather factors on different crops and horticultural crops.

SEASONAL PROFUSION

Most of insects and pest development commonly seen in rainy season, where, the insects like aphids, thrips, mealy bugs, whiteflies and mites are comparatively more recurrent during summer season. In rice the blast disease and powdery mildew in other crops are common in summer.

A) RICE PEST AND DISEASES

In pest of rice gall midge was strongly dependent on weather while other pests are likely dependent on the season and occurs in distinct crop growth stages. The occurrence of gall midge was more likely to occur during kharif season than rabi because of its requirement of humidity especially in growing stages of

the pest. For successful establishment of infection for the crop this pest requires 80% of relative humidity. There was a positive correlation between pest incidence and negative correlation was present with maximum temperature (Thomas et al., 1975). Pre-monsoon rainfall during March, April and May initiate the increase in the gall midge number at the nursery time and infect the crop in the field. Prolonged rainfall and low maximum temperature while plants are at tillering stage may also increase the gall midge infestation.

Moderate rainfall, relative humidity about 80% and broad range of atmospheric temperature ranges from 23 to 33°C leads to high chances of BPH (Abraham and Nair, 1975). This type of condition exists during winter crops (Aug-Sep, to Dec – Jan.) and the pest growth occurs more rapidly during this season. Brown spot also become high in rabi season than on kharif. The number of rainy days and minimum temperature greatly affects the spread and development of disease if the dew nights are more during rabi.

B) COCONUT PEST AND DISEASES

Many types of diseases and pest attacks the coconut, but a few are discussed below on the basis of their occurrence.

PEST

The cockchafer beetle is a well known as *root grub* or *white grub*. The population rise cockchafer beetle occurs in June and July and goes down in summer (February –May). This pest was highly dependent on soil than outside atmospheric conditions as immature stages develop in soil layers. Sandy or sandy loamy soils are highly preferable by them for multiplication under favourable microclimatic conditions. Along with this some other pest also attacks the coconut like rhinoceros beetle; red palm weevil and black headed caterpillars are some other kind of important pest that effect coconut crop. Black-headed caterpillar generally attacks throughout year but their population reaches maximum at summer season. This is because temperature and relative humidity become gradually favourable for their growth and become unfavourable for its associated enemies. In Rhinoceros beetle, there were no such seasonal conditions, but their population will become considerably more in rainy season than other seasons. Red palm weevil, which was considered the most destructive pest for coconut, shows its maximum infestation on dry weather conditions from January to May.

DISEASES

The commonly occurring diseases are bronze wilt, stem bleeding

BRONZE WILT: This disease is more common in non traditional areas where, there are hot summers and sever moisture stress conditions that are existing. During periods of drought, the leaves of the plant become bronze colour and drop off finally. It is severe danger in Tamil Nadu, Andhra Pradesh and Karnataka.

STEM BLEEDING: This stem bleeding disease in was most common in northern districts in Kerala and relatively lesser in southern parts. Uninterrupted wet spells fallowed by long dry spells are considered as one of the factors for the incidence of stem bleeding in coconut. The fungus enters into stem through the cracks. This disease was characterised by oozing of dark brown viscous liquid through these cracks.

BUD ROT OF COCONUT: This occurs sporadically during the rainy season. This disease was most common in humid areas during post monsoon and monsoon showers. There was no any correlation was

observed between temperature and outbreak of disease but there was a correlation between establishment and disease occurrence.

C) PEST IN CASHEW

In south India Tea mosquito bug was a serious pest on cashew that causes inflorescence blight and drying up of shoots and nuts. The December to February periods are considered the most favourable period for the multiplication and population build-up that simultaneously occur with the flushing and flowering phases of cashew. This pest enters in low population phase during April and May and also found that this pest was totally found in rainy season. This crop experiences sever loss due to large scale drying up of young shoots and inflorescences. Immature nuts are also dried up and seen hanging with panicles. This was result of severe infestation of tea mosquito bug that was followed by moderate fungal infection.

D) LEAF SPOT IN BANANA (SIGATOKA)

This disease occurs in all stages of the crop mainly during South-West monsoon season, and comparatively low during rest of the year. The incidence and dissemination were identified during periods where relative humidity was greater than 90% with more than 5 hours of bright sunshine hours per day after completing a continuous wet spell. The disease spreads rapidly in cloudy weather when frequent maximum and minimum temperatures were around 20°C and 30°C respectively.

CONCLUSION

From the above observations it was clear that weather plays an important role in inducing the outbreaks of pest and diseases. In temperate areas, pest and disease forecasting was more relatable because of lack of involvement of biotic and biotic factors that may lead to forecasting deviations. As the pest and disease attack increases on host plants under complimentary environmental conditions, it was difficult to understand the system and warn before the further increase of pest and disease attack unless combined effects are made to make a good data base. Different models like linear and non linear regression models, logistic models, and computer-based simulation models are being used from the past few years. Particularly in India, the forewarning and early warning models are mostly in budding stage despite of few models availability. Hope there will be new path for predicting the occurrence of pest and diseases with relatable accuracy has to be invented and development of relatable models should be adopted.