

Aerobiological approach to leaf spot and rust disease of groundnut (*Arachis hypogaea* L.)

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Accepted : August, 2008

ABSTRACT

Ground nut (*Arachis hypogaea* L.) occupies first place among the all oil seed crops in India. It is also subjected to various types of fungal diseases, which causes extensive damage to crop in the quality as well as quantity of the yield. The Tikka leaf spot (*Cercospora arachidicola* and *C. personata*) and rust (*Puccinia arachidis*) has been occurring in a serious form in every groundnut growing area of the country. Aerobiological experiments were carried out to find out the concentration of pathogenic fungal form, their relation with the meteorological parameters and growth stages of crop. Air sampling was done during from July to October in both years of 2004 and 2005. Air monitoring revealing that maximum concentration of Leaf spot pathogen and rust pathogen were observed in air during October of both the seasons. Maintained meteorological data throughout the period of investigation to correlate with the incidence of pathogen and severity of infection. The role of the meteorological factors for survival of the pathogen, growth stages of the crops and disease incidence have been discussed.

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Key words : Tikka disease, Rust, Cercospora, Puccinia, Groundnut.

Groundnut (*Arachis hypogaea* L.) occupies first place in order of importance, out of the all oil seed crops growing in India. About 75 million hectares of land is under groundnut cultivation and the production is about 6 million tonnes.

Groundnut is also subjected to various types of fungal diseases, which causes extensive damage in the quality as well as quantity of the yield. The Tikka leaf spot (*Cercospora arachidicola* and *Cercospora personata*), the caller rot (*Aspergillus niger* and *A. pulverulentum*) and Rust (*Puccinia arachidis*) have been occurring in a serious form in recent years in most of the groundnut growing areas and has limited the cultivation of groundnut. It is proposed to carryout the aerobiological investigation over the groundnut to find out the time and date of the onset of the pathogen and subsequent inset of the disease, severe epiphytic, if any and the role of the environmental factors for the survival of the pathogen. The ultimate aim behind this investigation is to provide a better and an efficient forecasting system for Groundnut.

MATERIALS AND METHODS

The aerobiological investigations have been carried out with the help of Tilak continuous air sampler (Tilak and Kulkarni, 1970). Tilak continuous air sampler continuously runs with 230 V. current and the drum present inside the sampler completes on a rotation in eight days. The air sampler was installed at a constant height of 1.5 m above the ground level in the groundnut field in the botanical garden of college. The air sampling was

started on 20/07/2004 to 30/10/2004 during Ist season and 01/07/2005 to 30/10/2005 during IInd season. Air sampling was continued till the harvest of the crop.

The meteorological data was maintained throughout the period of the investigation. Scanning and detailed calculations were obtained by using same method described earlier (Tilak and Srinivasulu, 1967). Identification of fungal spore was accomplished with the help of visual identification and literature after Ellis (1971), Burnett and Hunter (1972) and Tilak (1980) and Nair *et al.* (1986).

RESULTS AND DISCUSSION

Leaf spot pathogen (Cercospora spp.):

During present investigation the first sign of infection of *Cercospora arachidicola* was noticed on the leaf blade after 32 days and 28 days of sowing during I season and II season, respectively. It was followed by the spot caused by *Cercospora personata* some what late on the leaf lets with small and differ from earlier. These were recorded after 44 days and 49 days of sowing during the 2004 and 2005, respectively. In both seasons two species of *Cercospora* i.e. *Cercospora arachidicola* and *Cercospora personata* firstly recorded at different intervals before the onset of their infection. They were recorded sporadically and less in number. However, occasional high catches were recorded on few days. The spores were recorded frequently after rainfall.

Concentration of *Cercospora arachidicola* was maximum and continuously trapped from 10th September