21. Development of integrated geospatial techniques for surveillance of pest and diseases in citrus

Aim

Surveillance of pests and diseases of citrus using different RS based models.

District-wise geospatial distribution products of pest and disease infected orchards of the study areas.

Scope

Citrus trees are evergreen, grown in truly subtropical climates of the world although in tropical regions of the world they tend to produce cyclic growth. Growth, productivity and yield of citrus crop is constrained by the climatic parameters such as temperature and humidity, and edaphic parameters such as soil pH, EC, texture, etc. Citrus cultivation is plagued with various problems due to high occurrence of pests and diseases. High humidity favours spread of many diseases. Remote sensing (RS) of biotic stress is based on the assumption that stress interferes with photosynthesis and physical structure of the plant at tissue and canopy level, and thus affects the absorption of light energy and alters the reflectance spectrum. The scope of this study is to develop techniques for identification of pest and disease infestation on the Citrus/Orange tress through spectral analysis, generation and study of suitable spectral indices using multi-spectral and hyperspectral remote sensing data.

Current constraints / Challenges

Pest and disease infestation dynamic. In case of low level of infestation, the impact may not be detectable in the satellite data analysis due to the low spectral variability and constraints of spatial resolution.

Availability of cloud free data throughout the year.

Availability of multi-temporal hyperspectral data of required spatial resolution is a major constraint to operationalize such studies for larger areas.

Expected outcome

Identification of suitable spectral indices for mapping pest/disease in Citrus trees.

Predicting citrus infested orchards using models, and upscaling it to other Citrus growing areas in the country.

District wise infested area map of major citrus growing regions of Central India.
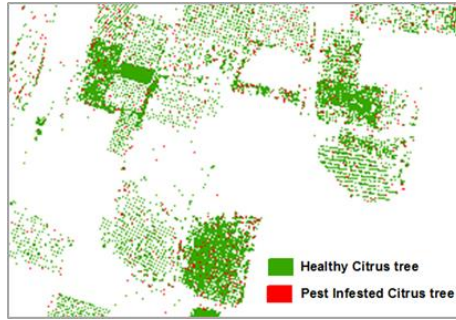
Pest infested citrus orchards from UAV data

Timeframe

2021 – 2024