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Geospatial analysis of foliar rust diseases of wheat crop in Jhelum district (2010-2015)

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This study was conducted to assess the past and present damaging effects of foliar rust diseases on wheat crop through Geographic information system tools. Wheat is the main cereal crop that is grown in Jhelum district on both irrigated and non-irrigated lands. Approximately, 200 diseases are reported on wheat crop in which 100 diseases are caused by pathogens and others are due to weeds and different parasites. Mostly rust diseases are air-borne and soil-borne. Foliar rust diseases; yellow/stripe rust, brown/leaf rust, powdery mildew and tan spot infect different parts of plants thus taking high toll of crop yield. This study focused on Jhelum district comparing the disease incidence data for last six years (2010-2015). Variation in Climatic Data including temperature, precipitation and humidity were analyzed for past six years because these variations are responsible for development of rust diseases. Mycotoxin risk assessment tool was used to assess the risk of Fusarium mycotoxins in wheat. Hotspot tool assesses clustering of high and low values thus used to identify hot and cold spots of rust diseases (leaf and stripe rust) in selected regions. Standard deviational ellipses showed the extent of variation of diseases exhibiting the directional trend for past six years. The results demonstrated in the form of graphs showed shift of diseases from one region to another depending on the climatic variation. In contrast to previous year, Leaf rust is more prevalent in Jhelum district. This study provided the information about spread and shift of leaf and stripe rust in Jhelum district through broad spectrum of geospatial analysis that result in real time visualization and predictive analysis. Leaf Rust is becoming more prevalent so the wheat varieties that are resistant against rust needs to be cultivated. Fungicides are also need to be used against development of mycotoxins that will ultimately lead to high yield of wheat crop.

Biography

Maria Neelam is currently pursuing PhD in Environmental Sciences from Fatima Jinnah Women University, Pakistan. She has worked as a Research Associate on Higher Education Commission funded project “Estimation of foliar and rust disease severity of rain fed wheat with GIS and remote sensing tools”.

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