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Effect of Climate Change on Insect Pest Population

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Climate change is the term used to describe a gradual increase in the average temperature of the earth atmosphere and its oceans, a change that is said to be changing the earth's climate forever. Global temperature has been rapidly rising since 1900 with an increase of about 1 °C since then. The greatest increase has been in northwestern part of America, but India's temperature has increased between 0.2 °C and 1 °C. The majority of the warming was observed over the last 45-50 years is attributable to human activities. The global mean surface temperature is predicted to increase by 1.4 to 5.8 °C from 1990 to 2100. If temperatures rise by about 2 °C over the next 100 years, negative effects of global warming would begin to increase to most regions of the world. High temperature eventually reduces yields of desirable crops while encouraging weeds ad pest's proliferation. Climate change in the usage of the Intergovernmental Panel on Climate Change (IPCC) referred to 'a change in the state of the climate that can be recognized by changes in the mean and or the changeability of its properties that persist for an extensive period, typically for decades or longer. It refers to any change in climate after a while, whether due to natural changeability or as the outcome of human activity.

This change is recognized mainly to the overexploitation and misuse of natural resources for various anthropogenic developmental activities such as increased urbanization, pollution, deforestation and industrialization resulting in aberrant weather events like changes in rainfall patterns, droughts and floods, increased intensity and incidence of heat and cold effect, outbreaks of insect-pest and diseases etc. affecting largely on many biological systems and ultimately on human population and animals. The climate is changing across the globe. Changes can affect the agricultural system through impacts on crops and their pests and pathogens. The effect of climate change on agricultural productivity has been studied for many years. These studies, relevant to crop production and climate change, have generally focused on crops, pests and pathogens.

Abundant evidence from these studies indicates that climate change can have direct negative impacts on crop yields. Climate change can have indirect impacts on crop productivity through effects on pests, pathogens, weeds and other biotic factors such as natural enemies of agricultural pests like crops, pests and pathogens that negatively affect crop growth, development, and yield formation, can be sensitive to climate change. To date, few studies have focused on the impact of climate change on the interaction between crops, pests and pathogens. A good understanding of the effects of these interactions, and the impacts of climate change, on crop productivity, especially of the most important global food crops, is imperative for global food security.

The climatic change affect the agricultural

Various agricultural practices through changes of water use and agricultural inputs such as insecticides and fertilizer. Climatic change affect directly or indirectly quality and quantity loss of production. Adaptation organism may become more or less competitive, as well as human. Rural space, through the loss and gain of cultivated lands, land speculation, land renunciation and hydraulic amenities.

Effect of Climate Change on Insect Pest Population

Climate changes is evident from increase in global average temperature, changes in the rainfall and extreme climatic events. These seasonal and long term changes would affect the fauna, flora and population dynamics of insect's pests. High temperature associated with climate change will tend influence insect species population dynamics directly through effects on survival, generation time, fecundity and dispersal. Changes in diversity and abundance of insect pests. Changes in geographical areas of insect pests. Climate change strongly affects the geographic distribution of insect pests, and this distribution is determined more by low temperatures than high temperatures. Insect population mortality may decrease with warmer winter temperature there by leading to pole ward range expansions. The abiotic factors are known to have direct impact on insect population dynamics through modulation of development rates, survival, fecundity and dispersal. Variation in synchrony between insect pests and⎫ their host crops. As temperature increase in globally, microbes, pathogens and pests will have the tendency to move poleward while leaving the equatorial region denied of their presence. Some microbes are beneficial to soil, crop and plants; therefore, their scarcity will impact negatively on soil, crops and different plant species. Rapid population development growth and no. of generations. Introduction of alternative hosts plants species. Temperature change affects insects directly since they are exothermic, therefore are more active under increased warmness. Thus, when temperature of the environment where an insect lives is increased, it will raise energy consumption rate and reduce pupation time as well as expose them to natural predators. For example, increased temperature will raise the activity of gypsy moth by decreasing it's time to grow and level of survival. Increased over wintering in insects.

Effect of Climate Change on the insect management strategies

Breakdown of host plant resistance: Host plant resistance is one of the most environmental friend method for managing harmful insect-pest's population in various crops wherein the plant can lessen the damage caused by insect-pests through various mechanisms like anti-xenosis, antibiosis and tolerance.

Biopesticides: Natural plant products, viruses, nematodes, fungi, bacteria, and synthetic pesticides are highly sensitive to the environment. Increased temperature will increase the activity of some of the insecticides. Diflubenzuron (an insect growth regulator (IGR) caused rapid mortality at higher temperatures and was more efficient at 35 C . The insect growth rate and moulting rate increase at higher temperatures.

Natural enemies: Relationships between insect pests and their natural enemies will change as a result of global warming, resulting in both increases and decreases in the status of individual pest species.