Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 04, Issue: 01 (JAN-FEB, 2024)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

Effect of Global Warming on Horticulture Crops

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Abstract
The effect of global warming is now visible in many parts of the world. Abnormality in climate patterns, induced by accelerated warming, has started to affect a catchment-specific hydrologic cycle. Higher temperatures lead to a high rate of evaporation and dry conditions in some areas of the world. Severe weather events are now more common. Scientists believe that rapid warming in the last several decades is mostly due to human-induced changes in the atmosphere, on top of some natural variations. Impacts of climate change are complex as they can be both direct and indirect, the biggest casualty being natural resources such as agriculture. Agriculture is a carefully manipulated ecological system, the productivity of which could increase because higher levels of carbon dioxide in the atmosphere could allow a higher rate of photosynthesis. However, many interacting factors are at work. At higher levels of warming, estimated monetary impacts generally become negative, and studies, allowing for disastrous possibilities, can reach high negative outcomes. Moreover, the perennial plants (mostly fruit plants) are at more risk than annuals or seasonals.

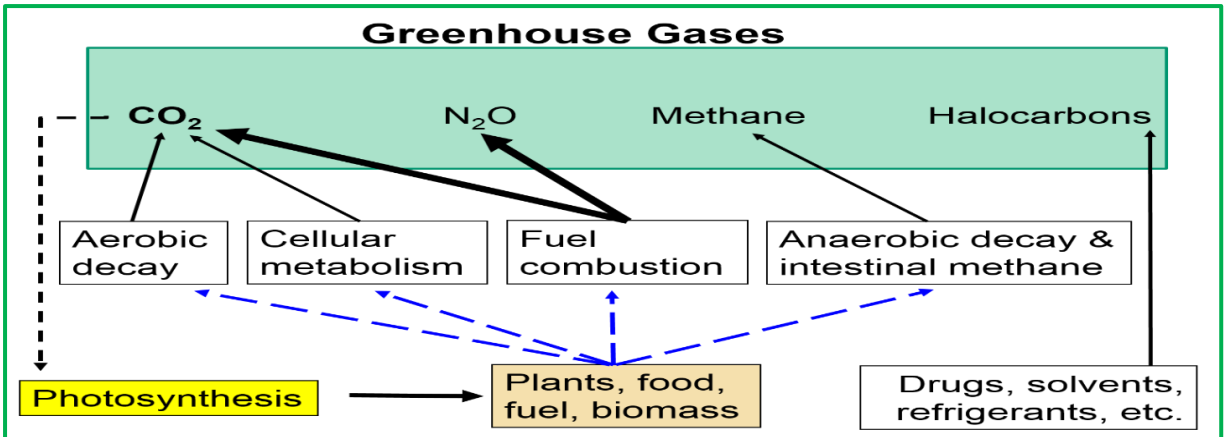
Keywords: Introduction, Impact on horticulture crops, The increase in global average temperature, Example of impact of climate change in horticulture crops, Conclusion, Reference.

Introduction
Global warming is the long-term warming of the planet's overall temperature. Though this warming trend has been going on for a long time, its pace has significantly increased in the last hundred years due to the burning of fossil fuels. As the human population has increased, so has the volume of fossil fuels burned. Fossil fuels include coal, oil, and natural gas, and burning them causes what is known as the "greenhouse effect" in Earth's atmosphere.

The greenhouse effect is when the sun's rays penetrate the atmosphere, but when that heat is reflected off the surface cannot escape back into space. Gases in the forms of widespread flooding and extreme weather. produced by the burning of fossil fuels prevent the heat from leaving the atmosphere.

Global warming has presented another issue called climate change. Sometimes these phrases are used interchangeably, however, they are different. Climate change refers to changes in weather patterns and growing seasons around the world. It also refers to sea level rise caused by the expansion of warmer seas and melting ice sheets and glaciers. Global warming causes climate change, which poses a serious threat to life on Earth.

The effect of global warming is now visible in many parts of the world. Higher temperatures lead to a high rate of evaporation and dry conditions in some areas of the world. Impacts of climate change are complex as they can be both direct and indirect, the biggest casualty being natural resources such as agriculture.



Impact on horticulture crops

The effect of global warming is now visible in many parts of the world. Higher temperatures lead to a high rate of evaporation and dry conditions in some areas of the world. Impacts of climate change are complex as they can be both direct and indirect, the biggest casualty being natural resources such as agriculture. Agriculture is a carefully manipulated ecological system, the productivity of which could increase because higher levels of carbon dioxide in the atmosphere could allow a higher rate of photosynthesis. However, many interacting factors are at work. Moreover, the perennial plants (mostly fruit plants) are at more risk than annuals or seasonals.

1. Extremes events that are difficult to predict,
2. More erratic rainfall pattern and
3. Unpredicted high temperature spell shall affect productivity

At the same time, more availability of CO2 would help in improved yield of root crops and increased temperature may shorten the period.

The increase in global average temperatures due to greenhouse gas emission could pose challenges like:

1. High temperature stress during critical crop growth stages,
2. Intermittent and/or terminal drought,
3. Excess moisture stresses caused by extreme rainfall events,
4. Incidence of insect pest and diseases and emergence of new insect pests and diseases.

Example of Impact of Climate Change on Horticulture

Impact of rising temperatures on Potato in Punjab: Potato grows between 2oC and 30oC. It requires cool night temperature to induce tuberization. Although photosynthesis in potato is suppressed by high temperature, it is not as sensitive to temperature as tuberization and partitioning of photosynthesis to tuber. The radiation use efficiency (RUE) is suppressed under high temperatures. High temperature reduces tuber number and size. Potato tuber yield was simulated for Jalandhar in Punjab using INFOCROP-Potato, without adaptations i.e. with recommended date of planting and optimal management practices for the current and future climate of varying temperature and CO2 concentration. The future climate scenario projects that the potato yields are likely to increase by 7.31% in 2020 (at 1oC and 400 ppm), and by +3.6% in the 2050s (at 3oC and 550 ppm) with respect to current climate. Amongst the major potato growing states in India, only Punjab and Haryana are likely to have increased in potato yields with the changing climate scenario, the rest are likely to lose yields.

Impact Of Climate Change On Quality Of Fruit Crops: Quality of fruits is hampered by the change in climate due to rise in temperature and precipitation, the size of fruits is reduced considerably and the fruits ripe before the maturity resulting in improper color of fruits.

Mango and citrus trees of low hills are drying due to more frost in winter. Temperate tree species are also moving to higher elevation and their sites were being taken by the tropical and subtropical tree species. There is also an increasing awareness of climate change issues at the rural level oriented by the way of climate affects. The immediate surroundings and livelihood of the people reflect the effect of climate on measurements of direct effect

Conclusion

In view of these problems, horticulturists will have to play a significant role in the climate change scenario and proper strategies have to be envisaged for saving horticulture. The most effective way is to adopt conservation agriculture, using renewable energy, forest and water conservation, reforestation etc. to sustain the productivity modification of present horticultural practices and greater use of green house technology are some of the solutions to minimize the effect of climate change. Improving agriculture is one of the highest priorities involved in achieving future sustainability. Many improvements in agriculture will be needed to feed the world' people adequately in the future. The negative environmental effects on agriculture, including loss of soil fertility, soil erosion, aquifer depletion, soil and water pollution, and air pollution, must be brought under control by using an array of methods. Many strategies exist to retard the loss of topsoil and degradation of agricultural lands, conserve water, conserve energy, and reduce reliance on agricultural chemicals. Moreover, plantation of horticultural (perennials) plants that are at greater risk can also help in mitigating the climate change effects by absorbing more radiation than annual or seasonal crops.

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