

Climate Change and Its Impact on Horticulture Production

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Introduction

Climate change is among the major world issues that the human civilization faces today. The global climate of the Earth has been changing and this is as a result of human activities. As much as climate change has a wider effect on ecosystems, human health and the economy this article is concentrated on the effects on horticulture production.

Evaluating Horticulture as a Science and Its Importance

Horticulture is the study and practice of gardening and growing of fruits, vegetables, flowers, and other plant; it is a significant component in the production of food and sustenance for humanity. Horticultural crops on the other hand are important in human nutrition since they contain vitamins, minerals and antioxidants unlike the staple crops such as rice, wheat and maize. Also, horticulture supports poverty reduction as it is an economic activity that generates income for millions of horticulture farm-

ers in the Developing countries notably the smallholders.

However, the horticulture needs very careful control of the environment probably making it the most sensitive to climate change. In horticultural production, climate variability as manifested fact which has occasioned major impacts on production in many parts of the world.

Temperature fluctuations as well as their consequences

The first and probably the most vivid impact of climate change exerted unto horticultural practices is the shifting of temperature regimes. Horticultural crops have small window of temperature that is most suitable for their growth and development. For instance, tomatoes being one of the most cultivated horticultural crops appreciated range of between 20 and 25 centigrade.

Warmer temperatures may promote plant and thus result in more advanced phenology, that is abbreviated season.

like a good idea, this practice leads to low yields since enough time to mature. Furthermore, stress caused by high temperatures has a number of negative effects in plant development and productivity such as blossom drop in tomatoes and peppers, fewer fruits formed on fruit bearing plants, and fruits.

Furthermore, its effect of raising the temperature further leads to the worsening of the water crisis, especially in water-deficit areas. Due to the effects of global warming there will be higher evaporation rates implying that of irrigation will in greater amounts thus exerting more pressure on the already over stretched water resources.

Impact on Soil Health

Climate change poses another problem to the sustainability of horticultural operations since soil health is equally at risk. Temperatures also speedup the process of degradation of soil organic matter hence reducing fertility and the amount of carbon dioxide that is put back to the

atmosphere. It also leads to the destruction of the earth's climate through enhancing further emission of greenhouse gases and losses of nutrients required for plant growth in the soil. However, fluctuations in precipitation levels may worsen situations such as erosion of soil especially where rain is expected to fall heavily since it leads to topsoil loss thus degrading of the soil.

Climate also changes the patterns of soil moisture; some areas of the territories get drier as a result of droughts. This is because microbial load will be lowered and the resulting effect is that soil health as well as the health of horticultural crops will also be lowered.

Changes in Precipitation Patterns

It is also affecting precipitation, which implies periods of heavy rainfall and even flooding in some whereas in other there are severe and long-lasting droughts. It is however important to note that both extremes can be so destructive to horticulture.

The horticultural crops in the areas which are characterized by high rainfall and floods are likely to be affected by water logging mainly leading to root rot and reduced oxygen in soil which results to plant death. Humidity also favors the development of fungal diseases for example the downy mildew in cucurbit vegetables and the late blight in potatoes. Conversely, drought can drastically reduce the amount of water available for irrigation thus the farmer must either cut on area under cultivation or quit horticulture altogether.

Besides, unpredictable rainy seasons do not correlate with the periods required by plants to grow and mature; Moreover, higher temperatures promote the germination and growth of plants hence shortening the growing period. This appear to be advantageous in certain ways since the plants take shorter time to grow fully thus producing minimal yields. Further, heat limits the plant's physiological activity and results in stress hit toxicological effects such as clean up of flowers



in tomatoes and peppers, poor fruiting and fruit scorches. Further, high temperatures bring about plant stress which manifests in such problems as blossom abscission in tomatoes and peppers, poor fruiting and sun scald on the fruits.

Further, the effects of rising temperatures are that the water deficit could be made worse, especially in areas that are already in the worst affected with water problems. Many of the horticultural crops require high amounts of water, and may be affected by drought stress in that they wilt, grow poorly and produce less fruit. The high temperatures cause raised evaporation rates meaning more water has to be applied to crops for irrigation and what is more; the water supplies are very limited.

Extreme Weather Events

Hurricanes, typhoons, heat waves, and frosts occur more frequently and intensely because of climate change at the Earth's surface. These events have potential to cause huge losses to horticultural

production.

For instance, hurricanes, and typhoons mechanically damage crops by uprooting trees, tearing branch, as well as impacting items such as green houses and irrigation frameworks. Effects include heat stress, reduced growth, fruits yield, as well as plant death most of which are due to thermal stress. On the other hand, early frost occurrences could be very devastating to temperature touch crops such as the oranges and avocados.

They also affect balance of horticultural products supply chain because extreme weathers affects the production. Transportation networks may be affected and rendered unusable and this is disastrous especially when it comes to the horticultural products that are often seasonal and require timely delivery to market.

The Effects of Pests and Diseases

Thirdly, climate change is changing the distribution and/or behavior of pests and diseases which are a risk to horticultural

tural crops. This is due to warmer temperatures and altered precipitation that contribute to favourable environment for pest development including aphids, whiteflies, thrips, fungi, bacteria and viruses diseases.

As an example, a notorious pest known as the Mediterranean fruit fly that targets fruits and vegetables is moving to other areas because of increased temperatures. This makes them vulnerable to attacks from pests that in turn lead to crop failures and require the use of more pesticides that may have an adverse effect on the environment and the people's pocket.

Also, climate change may also reduce plant's ability to defend itself against pests and diseases. These conditions cause the plant to be stressed and hence, more susceptible to attack; thus creating a cycle of declined health and increased pest challenge.

Mitigation and Adaptation Strategies

However, climate change poses severe effects on horticulture, but there are measures that can be taken mitigating the impacts of climate change on horticulture production.

1. Breeding Climate-Resilient Varieties:

You have got to work and popularize heat- and drought-tolerant and pest-resistant crops. For instance, there are different types of tomatoes that are soluble in dry conditions, which may be bred through cross breeding or through genetic modification through recombinant DNA technology.

2. Improved Irrigation Practices:

Conservation methods like use of drip irrigation and water harvesting can be of help in ensuring that crops are watered in the right month at the right time.

3. Integrated Pest Management (IPM):

IPM is the process of using biological, cultural and chemical measures for pest and disease management in an environmentally sensitive manner. It has an advantage of lowering the use of

chemical pesticides and can address the effects of climate change on pest status.

4. Use of Protective Structures: Use of green houses, shade nets and other structures can act as a shield to plants from harsh WEATHER conditions and provide an ideal growing conditions for crops.

5. Diversification and Crop Rotation: With this, crop diversing and crop rotation also help in preventing crop failure because of the undesirable effects of climate. It also aids in the sustenance of good soil condition, also minimize the high incidence of pests and diseases.

Conclusion

Pest and disease pressures and climatic factors such as temperatures or rainfall affects horticulture production since climate change impacts almost all the factors involved in production. But by implementing both the avoidance and preparedness measures then it is possible to make horticultural systems more resilient and guarantee production of fresh fruits and vegetables to the consumer. Mitigation of climate change impacts on horticulture is not simply an agricultural issue but critical for global food security, rural economic and social wellbeing and human health.