

Effect of Drought on Crops and Management of Drought

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SUMMARY

The Effect of Drought on Crops and Management of Drought is a comprehensive investigation into the intricate dynamics between water scarcity and crop performance. As climate change accelerates, drought events are becoming more frequent and severe, posing a significant threat to global food production. This paper reviews the physiological, biochemical, and molecular responses of crops to drought stress, elucidating the mechanisms by which plants perceive and cope with water deficits. Furthermore, the study evaluates the direct consequences of drought on crop yield, quality and resilience. It also explores the broader impact on agricultural ecosystems and the ensuing challenges for global food security.

INTRODUCTION

Drought is a pervasive environmental phenomenon with far-reaching consequences, significantly impacting agricultural systems and global food security. As climate change intensifies, the frequency and severity of drought events are expected to increase, posing formidable challenges to crop production worldwide. This necessitates a comprehensive understanding of the intricate interactions between drought and crops, as well as the development of effective management strategies to mitigate the adverse effects on agricultural productivity. The multifaceted relationship between drought and crops, exploring the physiological, biochemical, and molecular responses of plants to water scarcity. Drought has significant adverse effects on crops, agricultural productivity, and overall food security. The impact of drought on crops can vary depending on factors such as the severity and duration of the drought, the type of crops, and the stage of crop development. Here are some of the key effects of drought on crops:

- 1. Water Stress:** Drought leads to water scarcity, causing water stress in plants. Water is essential for various physiological processes in plants, including photosynthesis, nutrient uptake, and transpiration. Insufficient water can hinder these processes, leading to reduced growth and yield.
- 2. Reduced Yield:** Drought directly affects crop yield by limiting the availability of water for optimal growth and development. Crops may experience stunted growth, delayed flowering, and poor fruit or grain development, ultimately resulting in lower yields.
- 3. Increased Susceptibility to Pests and Diseases:** Drought-stressed crops are often more vulnerable to pests and diseases. Weakened plants may be less able to defend themselves against insect attacks or pathogen infections.
- 4. Altered Nutrient Uptake:** Drought can impact the availability and uptake of essential nutrients by plants. Reduced water availability can limit the movement of nutrients in the soil, affecting their accessibility to plant roots.
- 5. Soil Degradation:** Prolonged drought can lead to soil degradation, as the lack of moisture contributes to soil erosion and reduced soil fertility. This can further exacerbate the challenges faced by crops.

To manage the impact of drought on crops, various strategies and practices can be implemented:

- 1. Water Management:** Efficient water management practices, such as rainwater harvesting, drip irrigation, and the use of water-efficient technologies, can help optimize water use in agriculture.
- 2. Drought-Resistant Crop Varieties:** Planting drought-resistant or drought-tolerant crop varieties is crucial. Crop breeding programs aim to develop varieties that can withstand water scarcity and still maintain reasonable yields.
- 3. Soil Conservation:** Implementing soil conservation measures, such as cover cropping and mulching, helps reduce soil erosion and improves water retention in the soil.
- 4. Improved Farming Practices:** Practices such as crop rotation, agroforestry, and conservation tillage can enhance soil structure, reduce evaporation, and promote overall resilience to drought conditions.

- 5. Early Warning Systems:** Developing and using early warning systems for drought can help farmers prepare for and mitigate the impact of water scarcity. This may involve monitoring weather patterns, soil moisture levels, and other relevant indicators.
- 6. Government Policies and Support:** Governments can play a crucial role by implementing policies that support farmers during drought periods. This may include financial assistance, insurance programs, and infrastructure development for water management.
- 7. Research and Education:** Continuous research to understand and develop strategies for managing drought impacts, along with educational programs for farmers, can contribute to building resilience in agricultural systems.

CONCLUSION

A combination of water-efficient practices, resilient crop varieties, and proactive management strategies can help mitigate the impact of drought on crops and enhance the overall sustainability of agriculture in water-stressed regions. Additionally, we will examine the broader implications of drought on crop yield, quality and overall agricultural sustainability. Recognizing the complex nature of this relationship, the study also seeks to shed light on innovative and sustainable approaches to drought management in agriculture.

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