JUSTIFICATION OF OPTIMAL IRRIGATION PROCEDURE OF BUKHARA-102 VARIETY IN CONDITIONS OF WATER SCARCITY

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Annotation. *In agriculture, the efficient utilization of water resources is critical, especially in regions facing water scarcity. The Bukhara-102 variety, known for its resilience and adaptability, necessitates specific irrigation procedures, particularly in arid or semi-arid environments. This article aims to explore the justification for an optimal irrigation procedure for the Bukhara-102 variety in the context of water scarcity.*

Key words: *irrigation procedure, justification, water scarcity, adaptability, cultivation.*

Introduction. Understanding Bukhara-102 Variety. The Bukhara-102 variety, a prominent cultivar in agricultural landscapes, is widely recognized for its capacity to thrive in challenging conditions. It exhibits traits such as drought resistance, tolerance to high temperatures, and adaptability to varying soil types. These characteristics make it an ideal candidate for cultivation in regions where water availability is limited.

Challenges of Water Scarcity. Water scarcity poses significant challenges to agricultural practices, particularly concerning the cultivation of water-intensive crops. In regions where the Bukhara-102 variety is cultivated, the scarcity of water resources necessitates the development of a precise and efficient irrigation strategy to ensure optimal yield while conserving water.

Optimal Irrigation Procedure. The optimal irrigation procedure for the Bukhara-102 variety in conditions of water scarcity involves a strategic combination of irrigation methods, soil moisture management, and timing. Drip irrigation, for instance, has shown to be effective in delivering water directly to the root zone, minimizing losses due to evaporation and runoff. Additionally, the use of soil moisture sensors can aid in determining the precise water requirements of the crop, thereby preventing over-irrigation. Furthermore, the adoption of mulching techniques can help in reducing water evaporation from the soil surface, thus contributing to water conservation. Implementing scheduling tools based on weather forecasts and evapotranspiration rates can further optimize the timing of irrigation, aligning it with the crop's actual water needs.

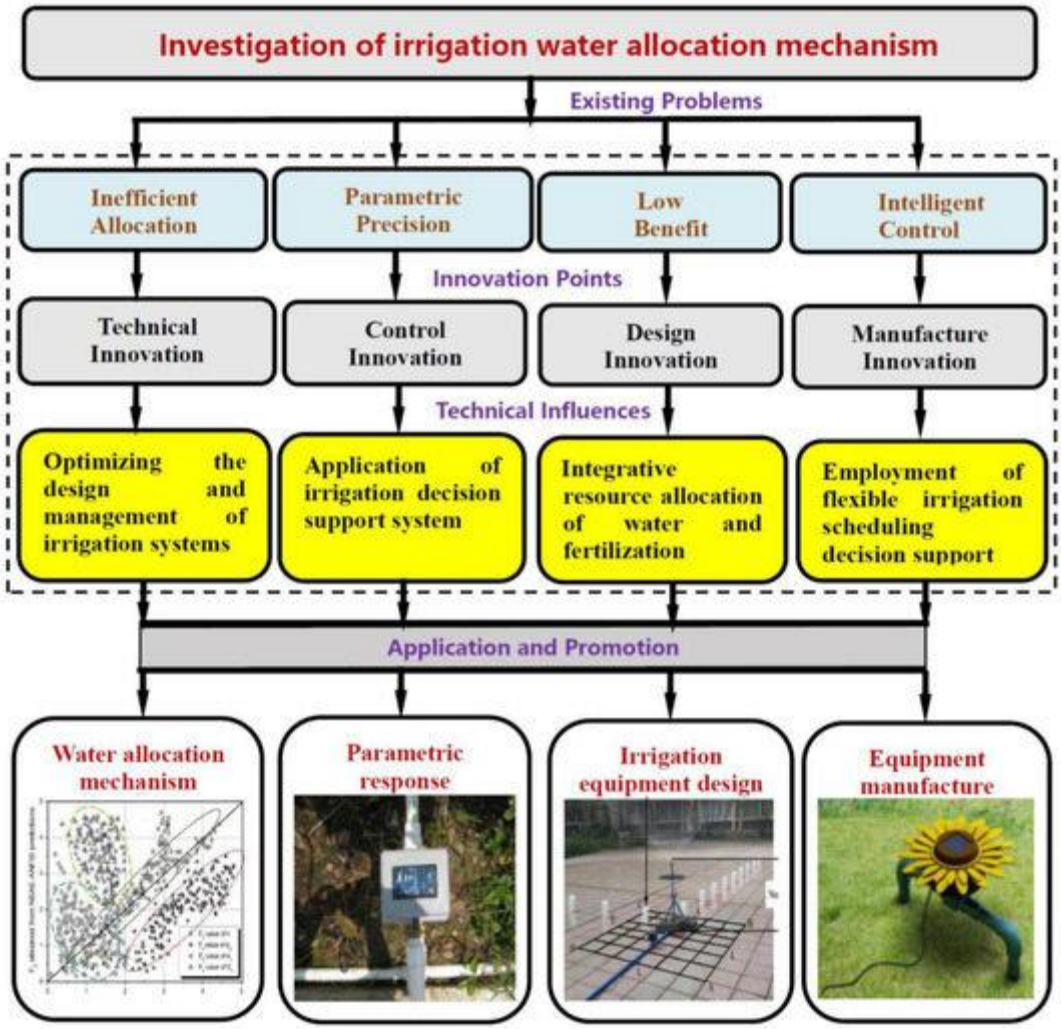

Figure 1. *Research progress and equipment development in the water allocation mechanism.*

Justification for Optimal Irrigation. The justification for the proposed optimal irrigation procedure lies in its potential to enhance water use efficiency, maximize crop yield, and mitigate the impact of water scarcity on agricultural productivity. By adopting a precision irrigation approach tailored to the specific needs of the Bukhara-102 variety, farmers can achieve sustainable production while minimizing water wastage. Moreover, the economic implications of implementing an optimal irrigation procedure are significant. By conserving water and maximizing crop yield, farmers can improve their resource utilization and reduce production costs, ultimately leading to improved profitability and resilience in the face of water scarcity. This article provides a throughout overview of the research developments in water allocation mechanism and integrative management effectiveness, and explains how they contribute to the sustainability and stability of irrigated agriculture. In the past several years, the water allocation mechanism

of precision irrigation makes remarkable contributions to the appropriate redistribution of water resources in the irrigated soil. Moreover, the integrative management effectiveness in irrigation practices becomes a decisive benchmark for accurate calibration of irrigated agriculture, especially in typical application cases such as moisture infiltration measurement, adaptive irrigation scheduling, and dynamic groundwater distribution. However, it is regretful that such important topics have rarely been focused on and discussed before, even if no previous research has provided such an important and flashed out the review on water allocation mechanism and integrative management effectiveness, which presents a major obstacle to the increase of irrigation efficiency and promotion of irrigation techniques during agricultural crop production. Therefore, it is an urgent need to propose a comprehensive review of these key topics to demonstrate their uniqueness and originality for precision irrigation. According to this conditional requirement, firstly, a systematic overview focusing on the water allocation mechanism is presented, followed by a set of concentrated comparisons of the performance properties of water allocation techniques in regards to the factors influencing irrigation environment; secondly, the integrative management effectiveness of precision irrigation is outlined; thirdly, with the future development prospects of precision irrigation being discussed, this paper makes conclusion eventually.

Future Directions and Conclusion. Moving forward, continued research and development in the context of precision irrigation, soil moisture management, and climate-resilient agricultural practices are crucial. Collaborative efforts between agricultural scientists, policymakers, and farmers can drive the widespread adoption of optimal irrigation procedures, ensuring food security and sustainability in water-stressed regions.

In conclusion, the justification for an optimal irrigation procedure for the Bukhara-102 variety in conditions of water scarcity is rooted in the need for sustainable agricultural practices, resource efficiency, and resilient crop production. By embracing precision irrigation, leveraging technological innovations, and prioritizing water conservation, farmers can navigate the challenges of water scarcity while harnessing the full potential of the Bukhara-102 variety in agricultural landscapes.

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