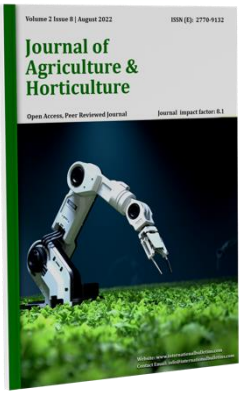

STUDYING THE ELEMENTS OF THE TECHNIQUE OF DRIP IRRIGATION OF COTTON IN THE CHANGING CLIMATE OF THE SURKHAN OASIS

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Annotation: In this article, the technique of drip irrigation of cotton in the continental climate of Surkhandarya region is studied on the basis of various analyses. Crop water status, optimal levels, evapotranspiration levels, and the need for effective water management from drip irrigation to drip irrigation. Drip irrigation requires proper soil preparation and ensuring uniform water distribution and effective water uptake by crop roots. Includes crop spacing, planting pattern, uniformity of water distribution, emitter spacing, filtration system, pumps, and irrigation schedule. In continental climates, temperature extremes, precipitation, impact, and wind loading of evaporation are a matter of improving crop water transfer and irrigation effects.

Key words: irrigation, soil properties, fertilization, cotton, technique, technology, climate, continental, water.

Introduction Studying the elements of drip irrigation technique for medium fiber cotton in the continental climate of the Surkhandarya region involves understanding the specific requirements of the crop, the environmental conditions, and the water management practices. Here are some key elements to consider:

Crop Water Requirements: Medium fiber cotton has specific water requirements during different growth stages. Understanding the crop's water needs, including the optimal soil moisture levels, evapotranspiration rates, and irrigation intervals, is essential for efficient water management using drip irrigation. Soil Characteristics: Assess the soil properties in the Surkhandarya region, such as texture, structure, drainage, and water holding capacity. Drip irrigation requires proper soil preparation and management to ensure uniform water distribution and efficient water uptake by the crop roots. Irrigation System Design: Develop a drip irrigation system design that considers the crop spacing, planting layout, water distribution uniformity, emitter spacing, filtration system, pumping requirements, and irrigation scheduling. The design should be tailored to the specific needs of medium fiber cotton and the continental climate conditions in the Surkhandarya region. Irrigation Scheduling: Implement a precise irrigation scheduling approach based on the crop's growth stage, soil moisture levels, weather conditions, and evapotranspiration rates. Utilize soil moisture sensors, weather data, and crop monitoring to optimize irrigation timing and frequency, ensuring that the cotton plants receive the right amount of water at the right time. Fertilization Management: Integrate fertigation practices into the drip irrigation system to deliver nutrients directly to the root zone of the cotton plants. Develop a fertilization plan based on soil nutrient analysis, crop nutrient requirements, and fertilizer solubility to enhance crop growth, yield, and fiber quality. Climate Adaptation Strategies: Consider the

impact of continental climate conditions, including temperature extremes, precipitation patterns, wind exposure, and evapotranspiration rates, on crop water use and irrigation efficiency. Implement climate adaptation strategies such as mulching, crop rotation, canopy management, and irrigation adjustments to mitigate water stress and optimize cotton production.

Monitoring and Evaluation: Implement a monitoring and evaluation plan to assess the performance of the drip irrigation system, crop health, yield potential, water use efficiency, and economic returns. Collect data on water usage, crop growth parameters, pest and disease incidence, and fiber quality to make informed decisions and improve the irrigation management practices.

Materials By studying and implementing the elements of drip irrigation technique for medium fiber cotton in the continental climate of the Surkhandarya region, farmers can enhance water productivity, increase crop yields, improve fiber quality, and sustainably manage water resources in agricultural production. Collaborating with agricultural experts, extension services, and research institutions can further support the adoption of efficient irrigation practices and technology transfer in cotton farming systems.

Background on drip irrigation in medium fiber cotton production statement of the problem and research objectives literature review drip irrigation in cotton: advantages and challenges optimizing irrigation scheduling and water application rates effects of drip irrigation on cotton yield, quality, and water use efficiency materials and Methods study site and experimental design. Soil characteristics and crop management practices drip irrigation system specifications and operation

data collection and analysis methods

Research and methods Soil Moisture dynamics Effects of drip irrigation on soil moisture content and distribution relationship between soil moisture and cotton growth and development plant growth and development Influence of drip irrigation on plant height, leaf area, and biomass Impact on flower formation, boll set, and plant maturity yield and quality Effects of drip irrigation on cotton yield, lint percentage, and fiber quality parameters comparison with conventional irrigation practices. Water Use Efficiency calculation of water use efficiency under drip irrigation. Analysis of the relationship between water use and cotton yield Optimization of Drip Irrigation

Results Determination of optimal irrigation scheduling based on soil moisture monitoring Evaluation of different water application rates and emitter spacing Strategies for improving water use efficiency and crop productivity Economic Analysis Estimation of costs associated with drip irrigation installation and operation assessment of the economic benefits of drip irrigation compared to conventional methods recommendations best practices for drip irrigation in medium fiber cotton in Surkhandarya region Guidelines for irrigation scheduling, emitter selection, and maintenance recommendations for future research and technology adoption summary of research findings and their significance Implications for cotton production and water management practices directions for further research and development modern Methods for Studying Drip Irrigation in Medium Fiber Cotton in the Continental Climate of Surkhandarya Region soil Moisture Monitoring Tensiometers and soil moisture sensors: Measure soil water potential and moisture content in real-time, providing data for precise irrigation scheduling. Neutron probes and gamma ray attenuation: Non-invasive methods to determine soil moisture content at different depths. Plant Water Status

Assessment Stem water potential measurement: Indicates the plant's water status and can be used to optimize irrigation based on plant water demand infrared thermography: Detects changes in leaf temperature, which can indicate water stress or irrigation inefficiencies. Irrigation Scheduling Soil water balance modeling: Simulates soil moisture dynamics to determine optimal irrigation timing and water application rates. Evapotranspiration (ET) monitoring: Measures actual crop water use, which can be used to adjust irrigation schedules based on weather conditions. Emitter Evaluation Flow rate and distribution analysis: Assesses the uniformity of water application by measuring emitter flow rates and distribution patterns. Clogging and fouling assessment: Monitors emitter performance over time to identify potential issues and implement maintenance strategies. Water Use Efficiency Analysis Water use efficiency calculations: Quantifies the amount of water used per unit of cotton produced. Crop water productivity analysis: Assesses the relationship between water use and cotton yield to identify opportunities for improving water use efficiency. Remote Sensing and GIS Satellite imagery and aerial photography: Provides high-resolution data on crop growth, soil moisture, and irrigation infrastructure. Geographic Information Systems (GIS): Integrates spatial data to create maps and models that support irrigation planning and management. Precision Irrigation Variable rate irrigation: Adjusts water application rates based on spatial variability in soil moisture or crop water. Smart irrigation controllers: Use sensors and data analytics to automate irrigation based on real-time monitoring of soil moisture and plant water status.

Discussion. There are several modern methods that can be used to study the elements of medium fiber cotton drip irrigation technique in the continental climate of Surkhandarya region: Remote sensing technology: Remote sensing technology can be used to monitor and analyze the performance of cotton crops under drip irrigation in real-time. This can help researchers identify any potential issues or inefficiencies in the irrigation system and make timely adjustments. Geographic Information Systems (GIS): GIS can be used to create detailed maps of the study area, including the distribution of drip irrigation systems and cotton crops. This can help researchers better understand the spatial relationships between different elements of the irrigation technique and identify areas that may require further investigation. Field experiments: Field experiments can be conducted to test different aspects of the medium fiber cotton drip irrigation technique, such as varying the spacing of emitters or adjusting the timing and frequency of irrigation. This can help researchers identify the most effective strategies for maximizing cotton yields in the continental climate of Surkhandarya region. Collaborative research: Collaborative research involving multiple stakeholders, including farmers, agricultural experts, and policymakers, can help ensure that the study of medium fiber cotton drip irrigation is relevant and applicable to the local context. This can lead to the development of practical solutions that can be implemented on a wider scale to improve agricultural productivity in the region.

Conclusion Studying the elements of the technique of drip irrigation of medium fiber cotton in the continental climate of Surkhandarya region can have several positive effects: Increased water efficiency: Drip irrigation is known for its water efficiency compared to traditional irrigation methods. By studying and optimizing the elements of the technique for medium fiber cotton in the continental climate, water usage can be minimized while still maintaining or even increasing crop yields. Improved crop yields: By understanding the specific requirements of medium fiber cotton in the continental climate of Surkhandarya

region, researchers can develop tailored irrigation strategies to optimize crop growth and yield. This can lead to increased productivity and profitability for cotton farmers in the region. Reduced environmental impact: Drip irrigation can help reduce water wastage and minimize the leaching of nutrients and chemicals into the environment. By studying and implementing drip irrigation techniques for medium fiber cotton, the overall environmental impact of cotton cultivation in the region can be reduced.

Sustainability and resilience: Developing and implementing efficient irrigation techniques for medium fiber cotton can enhance the sustainability and resilience of agricultural systems in the Surkhandarya region. This can help farmers adapt to changing climate conditions and ensure the long-term viability of cotton production in the area. Economic benefits: Optimizing the elements of drip irrigation for medium fiber cotton can lead to cost savings for farmers through reduced water usage, labor, and input costs. Additionally, increased crop yields and improved crop quality can contribute to higher incomes and improved livelihoods for cotton farmers in the region. Studying the elements of drip irrigation for medium fiber cotton in the continental climate of Surkhandarya region can lead to a range of positive effects, including increased water efficiency, improved crop yields, reduced environmental impact, enhanced sustainability, and economic benefits for local farmers.

References:

1.Drip irrigation and its investment opportunities in Armenian agriculture 2018 / Manucharyan M.

2.Modern drip irrigation method is guaranteed plenty of harvest 2019 / Khamraev Kamol Shuhratovich, Muinov Ulugbek Bahtiyorovich, Juraev Alisher Nasirovich

3.Improving drip irrigation technology of the crops 2019 / Azizov Shohruh Numanovich, Dustnazarova Sanobar Ataullayevna

4.Drip irrigation in Pakistan: status, challenges and future prospects 2016 / Khan Muhammad Usman, Tayyab Muhammad, Majeed Majid, Shariati Mohammad Ali, Rashidzadeh Shilan, Mohammadlou Alireza, Plygun Sergey

5.Irrigation of cotton by water-saving method 2022 / Jurayev, A.K., Jurayev, U.A., Atamurodov, B.N., Sobirov, K.S., Najmiddinov, M.M.

6.Water-saving irrigation technology in the foothill areas in the south of the Republic of Uzbekistan 2022 / Ismayil Khudaev, Jamoliddin Fazliev

7.Ahrorov, Z., & Utkirov, A. (2023). Securities as a source of financing investment projects. Best Journal of Innovation in Science, Research and Development, 2(7), 468-473.

8.Jorayev, B. (2023). The Role of Tax Benefits in Socio-Economic Development. Central Asian Journal of Innovations on Tourism Management and Finance, 4(6), 149-152.

9.O'tkirov, A. (2024). The role and importance of new innovations in the field of water management. Ijtimoiy fanlarda innovasiya onlayn ilmiy jurnali, 4(3), 102-104.

10.O'tkirov, A. (2024). To what extent our entrepreneurs are able to take advantage of the wide range of opportunities offered to entrepreneurs in our country today. Ta'lim va rivojlanish tahlili onlayn ilmiy jurnali, 4(4), 62-64.

11.O'tkirov, A. (2024). International production assessment and international investment treaties. Boshqaruv va etika qoidalari onlayn ilmiy jurnali, 4(4), 9-12.

12.Umirov, I., & Utkirov, A. (2023). Ways to improve the organizational and economic mechanism of providing services in the healthcare system. Gospodarka i Innowacje., 37, 1-3.
13.Beknazar, S., Islombek, U., Aslbek, U., & Madamin, T. (2024). Analysing Tourism Expenses using Mathematical Modelling. European Journal of Contemporary Business Law & Technology: Cyber Law, Blockchain, and Legal Innovations, 1(2), 29-34.
14.Utkirov, A. (2021). A Study of the Life Stage of Abdul Avloni in the Third Renaissance. Central Asian Journal of Social Sciences and History, 2(3), 33-37.
15.Togaev, S., & Utkirov, A. (2023). The impact of human resources on improving the quality of financial services. Best Journal of Innovation in Science, Research and Development, 2(7), 474-479.
16.O'tkirov, A. (2024). International production assessment and international investment treaties. Boshqaruv va etika qoidalari onlayn ilmiy jurnali, 4(4), 9-12.
17.Kodirova, M. M., & Anvarova, S. (2024). TIBBIY MALAKALI MUTAXASISLARNI TAYORLASHDA UMUMIY TIBBIY PEDAGOGIKADAN FOYDALANISH MEHANIZMI.(KOMMUNAL VA MEHNAT GIGIYENASI FANINI OQITISH MISOLIDA). Ta'lim innovatsiyasi va integratsiyasi, 20(4), 59-63.
18.Kodirova, M. M., & Muxammadova, G. Q. (2024). PEDAGOGIK TEXNOLOGIYALAR TIZIMINING TIBBIYOT FANLARINI O 'QITISHDAGI O 'RNI (Kommunal va Mehnat gigiyenasi dars mashgulotarini organayzerlar asosida). PEDAGOGS, 53(1), 37-41.
19.Muxammadova, G. Q., & Kodirova, M. M. (2023). ISHLAB CHIQARISH SANOAT KORXONALARINI AHOLI YASHASH JOYLARI ATMOSFERA HAVOSIGA TASIRI. Экономика и социум, (11 (114)-2), 274-279.
20.Mukhammadova, G. Q., Kodirova, M. M., & Boqijonov, F. A. (2024). THE EFFECT OF INDUSTRIAL ENTERPRISES ON ATMOSPHERIC AIR. British Journal of Global Ecology and Sustainable Development, 28, 5-9.
21.O'tkirov, A. (2024). To what extent our entrepreneurs are able to take advantage of the wide range of opportunities offered to entrepreneurs in our country today. Ta'lim va rivojlanish tahlili onlayn ilmiy jurnali, 4(4), 62-64.
22.O'tkirov, A. (2024). The role and importance of new innovations in the field of water management. Ijtimoiy fanlarda innovasiya onlayn ilmiy jurnali, 4(3), 102-104.
23.Beknazar, S., Islombek, U., Aslbek, U., & Madamin, T. (2024). PhD Janzakov Bekzot Kulmamat ugli. European Journal of Artificial Intelligence and Digital Economy Volume, 1(1).