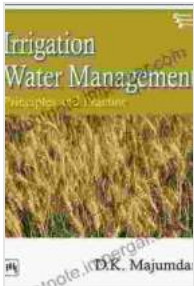


Irrigation Water Management: A Comprehensive Guide to Principles and Practices



Irrigation Water Management: Principles and Practice

by Nic Fields

★★★★☆ 4.4 out of 5

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In an era of increasing water scarcity, irrigation water management has become paramount for sustainable agriculture. This comprehensive guide delves into the principles and practices that underpin effective irrigation strategies, empowering farmers, agronomists, and water managers alike with the knowledge and skills to optimize water use while maximizing crop yields.

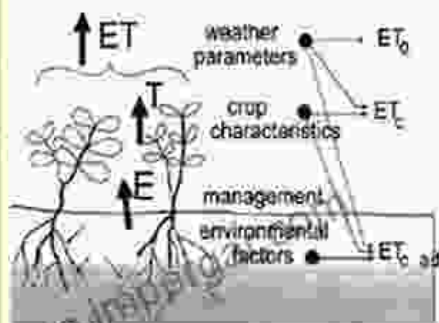
Principles of Irrigation Water Management

1. Crop Water Requirements

Crop Water Requirements



Lecture note for Soil and Water Management Course
Prepared by Dr ND Nang



- The crop water need (ET crop) is defined as the amount (or depth) of water needed to meet the water loss through evapotranspiration

- The crop water need mainly depends on
 - The climate

Determining crop water requirements is the cornerstone of efficient irrigation. Factors such as plant species, growth stage, climate, and soil conditions influence water needs. Accurate estimation ensures precise application, preventing overwatering and waterlogging.

2. Soil-Water-Plant Relationship



The interplay between soil, water, and plants is crucial. Soil texture, structure, and organic matter content impact water availability and movement. Understanding this relationship enables the development of irrigation schedules that optimize water absorption by plants.

3. Irrigation Methods



Choosing the right irrigation method depends on factors such as crop type, soil characteristics, and available resources. Surface irrigation, sprinkler irrigation, and drip irrigation each offer unique advantages and disadvantages.

4. Irrigation Scheduling

NUMBER OF EMITTERS PER PLANT. Table courtesy of the Rain Bird Corporation

	SOIL TYPE		
	Coarse	Medium	Fine
Estimated wetted diameter per emitter (feet)	2.0	3.0	4.5
Estimated wetted area per emitter (square feet)	3	7	16

PLANT SPACING (ft) x (ft)	PLANT ROW AREA (sq. ft)	NUMBER OF EMITTERS PER PLANT		
2	3	2	2	2
3	7	2	2	2
4	13	4	2	2
5	20	6	3	2
6	28	8	4	2
7	38	12	5	2
8	50	16	7	3
9	64	20	9	4
10	79	25	11	5
12	114	36	16	7
14	154	49	22	10
16	201	64	28	13
18	254	81	36	16
20	314	100	44	20

Effective irrigation scheduling ensures that crops receive water at the appropriate time and amount. Techniques such as soil moisture monitoring, evapotranspiration estimates, and crop-based models provide guidance for determining optimal irrigation timing and duration.

Practices for Sustainable Irrigation

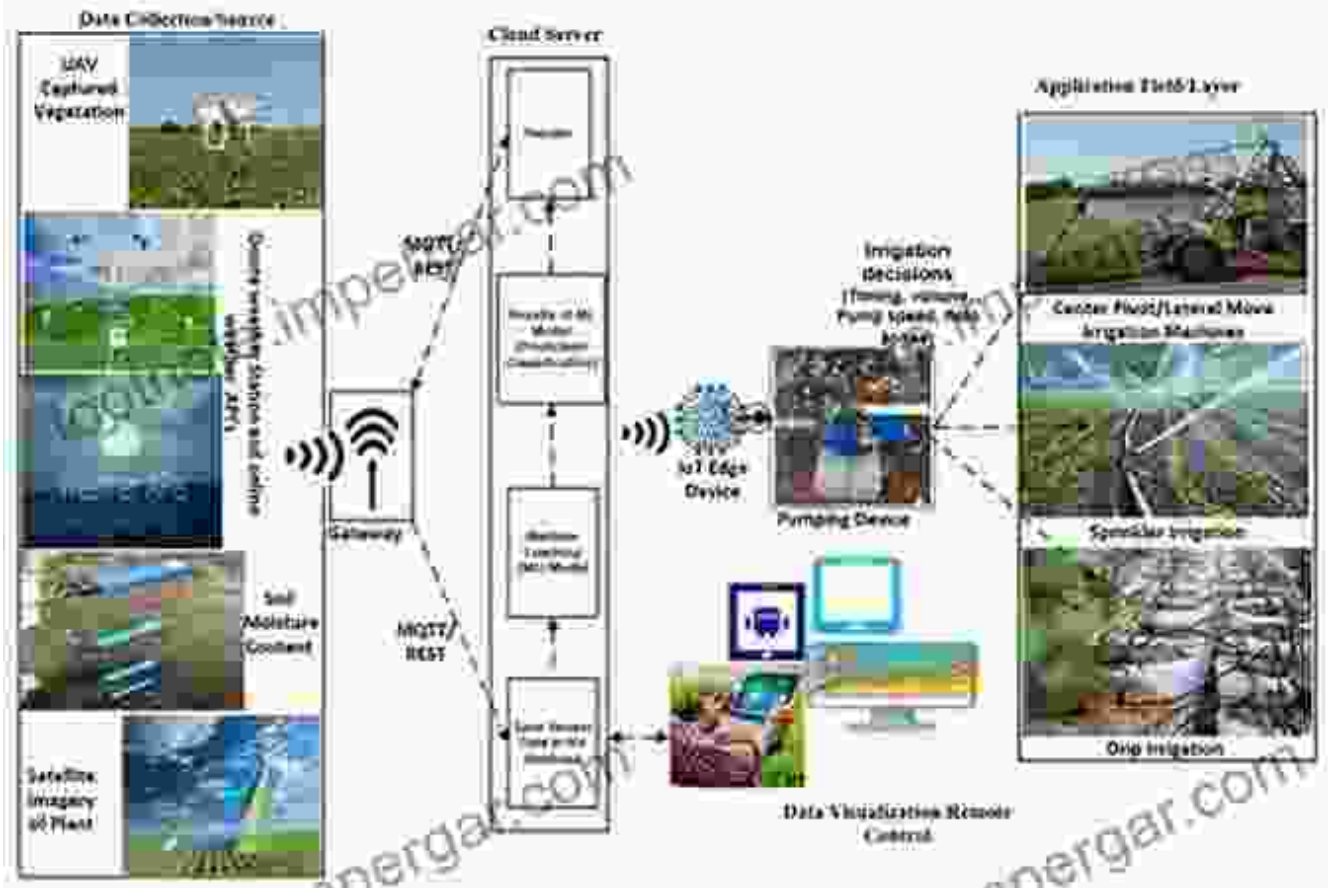
1. Water Conservation Strategies

CURRENT RESTRICTIONS



Adopting water conservation practices is essential for sustainable irrigation. Mulching, drip irrigation, and deficit irrigation techniques can significantly reduce water usage without compromising crop yields.

2. Precision Irrigation Technologies



Precision irrigation technologies, such as soil moisture sensors and variable rate irrigation systems, enable precise water application based on real-time monitoring. This optimizes water use and minimizes environmental impacts.

3. Monitoring and Evaluation



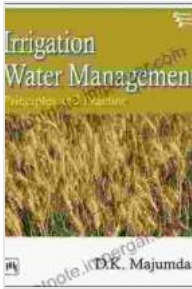
Regular monitoring and evaluation are crucial for assessing the effectiveness of irrigation practices. Data on water usage, crop growth, and soil health help identify areas for improvement and ensure continuous optimization.

Irrigation water management is an intricate science that requires a blend of knowledge, skill, and innovation. By understanding the principles outlined in this guide and implementing sustainable practices, professionals can enhance agricultural productivity, conserve precious water resources, and mitigate the effects of climate change. As the world grapples with water scarcity, this comprehensive guide serves as an invaluable tool for those committed to safeguarding our agricultural future.

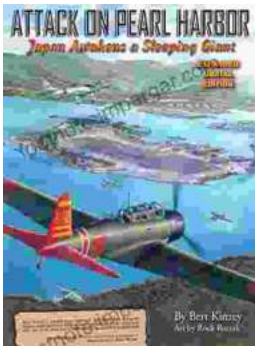
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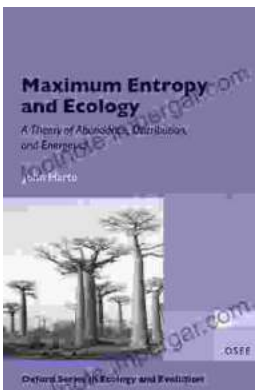


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