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WATER REQUIREMENT AND MANAGEMENT TECHNQIUES IN FIELD AND FRUIT CROPS

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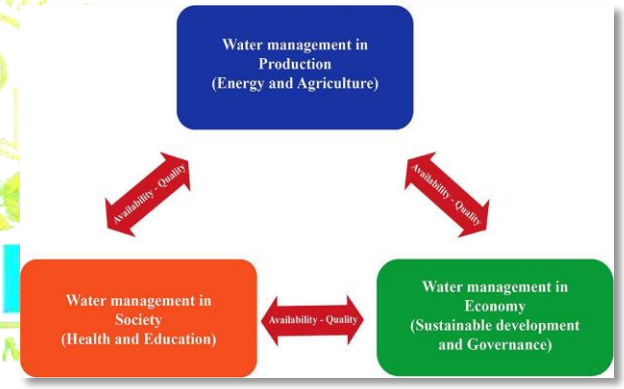
INTRODUCTION

Water is a vital component of agricultural output, which is essential to the nation's food security. The effects of urbanization, population growth, and climate change on agriculture lead to increased water use and anticipated increases in competition for water resources, which have an impact on agriculture. It is time for water conservation and the adoption of water management strategies for various field and fruit crops in order to address the problems of future requirements and bring about sustainable development. Future requirements can be met by reconsidering how water is managed in the agricultural sector.

Agricultural water management (AWM) means utilized water in a manner that improves agricultural yield and protects the environment. For a variety of crops to yield properly, there must be an adequate supply of water. The water requirement in crops depends upon soil, climate, season, and different growth stage of crops.

Benefits of Water Management

- Reduce damage from soil erosion.
- It acts as shield during less rainfall.
- Crop yield increases
- aid in storing extra water from runoff.
- It aids farmers in increasing the financial value of their productive land.
- The year-round excess of water for livestock/domestic consumption as well as supplementary irrigation to crops.



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WATER MANGEMENT TECHNQIUES

1. Crop planning:

Based on water requirement to different crops and availability of water for crop production. The research by Vasant Rao Naik Marathwada Agricultural University, Parbhani, suggests that cotton and summer groundnut cropping systems are more

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economical for farmers with 15-16 water shifts in summer, while hybrid sorghum-wheat/pearl millet systems are more economical for farmers with 3-5 water shifts during rabi season.

2. **Irrigation of land on basis of availability of water**:

The Maharashtra State has four regions for bringing maximum area under irrigation in future need to adopt irrigation technique based on land capacity. Whereas all types of soil are not equally suitable for providing irrigation regularly.

Ex. Soils with deep sandy loam, silt loam is suitable for irrigation. However shallow, sandy, and crystalline soils is suitable for limited irrigation such soil needs to be watered lightly but frequently and distance between irrigation systems is also reduced.

3. **Management of Saline Water:**

The low rainfall region experiences moderately saline ground water, with chloride, sulphate, sodium, and magnesium dissolved in highly saline water. Management practices can prevent adverse effects, and tolerant crops should be selected.

Ex. Sorghum, Cotton, Sorghum, Safflower, and Wheat.

4. **Management of waterlogged, saline, and choppy land**

The land levelling with suitable slope for reducing number of soluble salts in soil. To be carried out for removal of excess water from waterlogged land, horizontal drains should made on slope of land at inward distance, main drainage drain should take towards that slope and connect it, so excess water remove from field without accumulating in field.

5. **Irrigation methods for crops**

The land levelling is necessary for irrigating crops by stream system and distribution of water flow equally across to field. As a result, crops growth found good, soil not eroded, and water wastage avoided.

Here is a brief overview of prevailing irrigation systems.

a. **Furrow Method:** For crops with close row-to-row space, prepare furrows at equal distances and turn off water before reaching the end of the sire on land with a slope of up to 0.3 percent.

Ex. Sorghum, Groundnut, Safflower Wheat, Gram.

b. **Steam method**: This method is suitable if soil has low infiltration rate, uneven slope (heavy soil) and undulating slope. The crops onion, garlic, leafy vegetables, gram, and wheat should grow and water with 4 to 6 meters wide steam.

c. **Broad Bed Furrow Method:** If soil having a slope up to 0.3 on basis of crop requirement 0.6- to 1-meter-wide

swaths should made with the help of a r, while keeping water flow 3 to 4 litres/second in each Sari and kept his diameter 80 to 100 meter. This method is suitable for sugarcane, maize, cotton, vegetables etc if land has steep slope, and equally sari should made at equal distance.

with water, and it is protected from gum disease. Whereas, in growing fruit trees size of ring should be increased according to trees age.

e. Modern Methods of Irrigation:

Drip Irrigation: In this method we irrigate the field but, water drop by drop is given directly near roots of crops. This method is fully automated also.

Table No. 1. Water requirement to different field crops

Sl. No.	Crop Name	Crop period	Total water period	Spacing between two irrigations, days	Required water. C/M	Yield (Q/Ha)
1.	Rice- Ratna	Jan - May	28	2-3	1994	50-55
2.	Groundnut- Phule Pragati	Dec. - April	11	10-12	660	22-24
3.	Mustard- Varuna	Nov. - Feb.	7	12-15	420	12-14
4.	Sunflower-E.C68414/ modern	Nov. - Feb.	10	7-8	600	10-12
5.	Cowpea – Konkan Sadabahar	Nov. - Feb.	9	10-12	540	10-12
6.	Moong – Pusa Vaishakhi	March - May	8	6-7	480	6-8
7.	Chilli – Konkan kirti	Dec. - May	23	5-6	1150	10-12
8.	Ghevda – Konkan Bhushan	Oct. - Feb	18	2-3	900	7-8
9.	Water melon – Sugar baby	Nov - Feb	29	6-7	1160	28-30
11.	Bhendi - Parbhani Kranti	Feb - May	12	4-5	600	10-12
12.	Kakadi - sheetal	Feb - Aprill	13	4-5	520	24-26

(Source: DBSKKV Krushi Daindin 2022)

d. Check Basin method: This method is useful for fruit, leafy vegetables, and banana. This method saved water and only tree base area is irrigated not entire soil. The citrus tree should irrigate through ring method, so that trunk of tree not come in direct contact

The distance between water period is Jan -15, Feb -15, March-10, April 7-8, May 6-7 days on basis of soil, climate and crop condition water requirement distance of crops may be change.

Table No. 2. Commonly water requirement to different fruits crop							
Sl. No	Crop Name	Year	Crop Spacing		Water required to each plant (Litre)		
			Sq. Mt.	Sq. Ft	Summer	Rainfed	Winter
1.	Mango	1	10 x 10	33 x 33	36	15	21
2.	Sapota	2-3	-	-	52	25	32
3.	Orange	1	6 x 6	20 x 20	28	20	19
4.	Sweet lemon	2-3	-	-	52	29	32
5.	Guava	4	-	-	128	55	58
6.	Pomegranate	1	5 x 5	16 x 16	27	14	15
7.	Custard Apple	2-3	-	-	43	23	24
8.	Lemon	4	-	-	79	49	52
9.	Grape	1	3 x 1.6	10 x 5	14	6	13
10.	Banana	-	1.5 x1.5	5 x 5	28	7	11
(Source: VNMKV Krushi Daindin 2022)							

JAL SHAKTI ABHIYAN MOBILE APPLICATION

STEPS TO USE APPLICATION

- Download the mobile application from Jal Shakti Portal or Google Play Store.
- To access the Jal Shakti Abhiyan mobile application, users must register by entering their registered mobile number and clicking 'Sign in'.
- Enter the one-time password (OTP) received on your registered mobile no. and click on 'verify OTP.'
- The profile screen will display relevant details after verifying OTP, allowing users to initiate site visit feedback and photographs by clicking on 'Capture activity'.
- Fill in the details and take geo-tagged photographs.
- To provide feedback, either general or activity-wise, use the drop-down screen on the side menu and click on submit.

KVK, HINGOLI ACTIVITIES UNDER JAL SHAKTI ABHIYAN

The Krishi Vigyan Kendra, undertaking awareness mela and training programme for farmers/farm women/rural youth in each month. The important intervention covered under abhiyan is water

conservation & rainwater harvesting, watershed development, reuse & bore well recharge structures, intensive afforestation. The extension literature, news publication and radio talk activity also undertaken by KVK.

CONCLUSIONS

The renovation of traditional and other water bodies/tanks, water conservation & rainwater harvesting, watershed development, reuse & bore well recharge structures, intensive afforestation intervention was undertaken by Government of India under Jal Shakti Abhiyan to revive India back to a sustained system of water conservation and efficient irrigation.

The recommendation given by State Agricultural University for different field, horticultural, vegetables crops should adopt by farmers for efficient utilization of water resources and bringing sustainable development.

The challenges of future requirements can resolve through water conservation, water harvesting and adoption of water management techniques which helps for achieving sustainable development goal on efficient use of water and eliminating hunger.

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