Name of Solution:

Need-based irrigation scheduling using Water Impact Calculator

Submitter: (ICRISAT)

Solution Overview

What is it, and what problem does it solve? Brief 2–3 sentence description.

Need-based irrigation scheduling involves applying water to crops based on actual soil moisture levels, crop requirements, and weather conditions, rather than on a fixed calendar schedule. It helps optimize water use, reduce wastage, and prevent both under- and over-irrigation, thereby improving crop yield and conserving water resources.

Key Features & Benefits

Main components and why it is useful? Bullet points summarizing methods, tools, and value added.

Need-based irrigation scheduling using the Water Impact Calculator involves key components such as i) retrieving soil biophysical parameters and ii) integrating weather data along with minimum data requirement on crop operation. This tool precisely determines the optimal timing and amount of irrigation based on field scale water budgeting. The Water Impact Calculator helps farmers make data-driven decisions by estimating water savings and crop yield benefits. This approach improves water use efficiency, reduces wastage, and ensures crops receive the right amount of water at the right time. By using the Water Impact Calculator, farmers can lower input costs, prevent soil degradation from over-irrigation, and enhance climate resilience by adapting irrigation practices to changing weather and water availability.

Where It Works and Where It Can Work

Existing and potential target regions, agroecologies, or farming systems. Include examples if available.

The Water Impact Calculator for need-based irrigation scheduling is particularly suited for regions facing water scarcity. It is highly relevant in dryland farming systems particularly groundwater fed ecologies and irrigated areas where efficient water use is critical for sustaining crop productivity. Potential target regions include drought-prone zones with over-exploited groundwater, and areas practicing high-value horticulture or cash crops that require precise water management. The tool can also benefit smallholder and large-scale farmers across diverse agroecological zones by helping optimize irrigation schedules tailored to local soil, crop, and climatic conditions.

Evidence & Impact

What results has it shown? Stats, pilot outcomes, or testimonials.

WIC based irrigation scheduling saves minimum 30% of irrigation requirements without compromising in yield yield. The Water Impact Calculator (WIC) has demonstrated significant improvements in water use efficiency across various agricultural settings. In a pilot study on chili cultivation in Karnataka, India, WIC-based irrigation scheduling resulted in a 5–25 cm reduction in water usage compared to traditional calendar-based methods, while maintaining similar yields.

https://www.jstor.org/stable/24908060

Scalability & Adoption Support

Why it can be scaled and what's needed to adopt it?

Low-cost, adaptable, partner-ready, etc.

The Water Impact Calculator can be scaled widely due to its user-friendly and adaptable design, making it suitable for diverse agroecological zones and farming systems. It requires minimal data base and can be integrated with mobile devices, or advisory platforms, making it accessible even to smallholder farmers.

Partners & Contact Info

Who's involved and how to connect? List of key contact and partners + email / phone.

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