

Brief #4: Incentivizing Participation

Determining the Impact of Voluntary Irrigation Withdrawals and Water Conservation Payments on Livestock Producers' Bottom Line

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Overview

- We evaluate the economic feasibility of voluntary irrigation withdrawals in grazing-based livestock systems in the Colorado region of the Upper Colorado River Basin.
- Our framework links reduced irrigation, forage production, and producer profitability, applied to the Western States Ranches irrigation withdrawal trials demonstration site.
- Results show that compensation requirements vary widely by enterprise type, but can be profitable for some enterprise types and irrigation shutoff dates, and increase when recovery effects are considered.

Purpose

This brief assesses whether voluntary irrigation withdrawals can be economically viable for livestock producers

The results and insight gained can help producers and policy makers:

- Quantify compensation needed to incentivize participation in water conservation programs
- Address a gap in understanding impacts on grazing-based livestock systems
- Inform design of agricultural water conservation policies in the Colorado River Basin

Approach

The analysis integrates production outcomes and partial budgeting to assess participation incentives under alternative irrigation withdrawal scenarios. We:

- Develop a partial budgeting framework comparing irrigation withdrawal scenarios to baseline irrigation
- Apply framework to Banner Ranch data from the Western States Ranches trial
- Model three enterprise types: market hay, leased pasture, and livestock grazing
- Evaluate both implementation-year and multi-year recovery impacts on production and profitability

Findings

Breakeven compensation is the minimum payment required to leave a producer no worse off under irrigation withdrawal

- It reflects the value of foregone forage production plus any additional costs associated with implementing the change.

Breakeven values vary widely by enterprise type, and recovery effects increase compensation

- For the implementation year only, breakeven values are about \$70/AF (leased pasture), \$331/AF (market hay), and \$387/AF (livestock grazing)
- When multi-year recovery impacts are included, breakeven values rise roughly 60–70%

Moderate withdrawals can be economically viable, but aggressive reductions are not

- Strategies like a July 1 shutoff tend to yield small positive or near-neutral returns
- More intensive approaches (e.g., shoulder-month or full withdrawal) generate large negative returns at the field scale.

Insights

Feasibility depends on how conservation payments interact with market conditions and operational constraints.

Participation incentives differ across enterprise types

- Leased pasture operations face the lowest breakeven & livestock producers face higher values due to direct impacts

Outcomes are sensitive to prices and program design features

- Profitability depends on livestock prices, water payment levels, and conserved water volumes
- Higher cattle prices raise opportunity costs and increase required compensation

Operational flexibility plays a central role in determining participation feasibility

- Producers with multiple pastures or surplus forage may more easily participate
- Smaller operations may need to adjust herd size, rely on purchase feed, or alter grazing strategies



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