Brief #3: Managing Implementation

Practical Guidance for Implementing Voluntary Irrigation Withdrawals on Pasture-Based Livestock Operations

Daniel Mooney[1], Perry Cabot[2], Dan Waldvogle[3], Mike Higuera[4]

Overview

➢ Livestock producers need practical, experience-based guidance on how voluntary irrigation reductions affect haying and grazing schedules, along with strategies for successfully implementing these practices.

➢ This brief presents key insights and lessons from demonstration-scales trials of limited irrigation practices implemented on working pastures in Colorado's West Slope region.

➢ We highlight tradeoffs in hay and grazing outcomes to inform both producers considering these strategies and program designers aiming to reduce disruptions to pasture-based operations.

Purpose

Drawing on demonstration-scale trials at Western States Ranches, we assessed workable approaches to sustaining pasture operations under voluntary irrigation withdrawals.

The findings will help stakeholders and policymakers:

- Understand how participating in water conservation programs may affect livestock operations, including forage availability and grazing schedules.
- Identify program design features that better align conservation objectives with the operational needs and constraints of pasture-based livestock systems.

Approach

We compared four scenarios: full-season irrigation, shut off on July 1, shut off on June 1, and no irrigation (full withdrawal).

Used expert judgement to estimate likely impacts of each scenario on forage production and grazing outcomes.

- Considered spring, early summer, late summer, & winter periods. Trials conducted on pastures at two locations.

Assessed potential ranges of effects on hay yield, stocking days, and pasture recovery.

- During both the implementation year and the following year.

Findings

Observed tradeoffs: Forage reductions increased with earlier irrigation shutoffs, resulting in lower hay yields, fewer grazing days (from winter stockpiles), and greater pasture fragility.

Late shutoff (July 1) supported hay potential and stocking days similar to full-season irrigation.

- Expect moderate reductions in winter grazing days (up to 25-50% lower compared to full-season irrigation).

Earlier shutoff (June 1) required more active management to adapt to less irrigation.

- Expect reduced crossover grazing and eliminating hay cutting in year of reduction, leave forage for winter grazing.
- Less regrowth in late summer results in reduced winter grazing days (up to 50-75% lower compared to full-season).

Full-season withdrawal (no irrigation) likely necessitates fully resting pastures.

- Mostly eliminates crossover grazing in implementation year and year after, and haying in implementation year.
- Expect very restricted winter grazing days (up to 75-100% lower compared to full-season irrigation).

Insights

Limited irrigation can work on pasture-based systems, but requires planning and adaptive management

- Within and across years in response to water availability and pasture recovery conditions
- No one-size-fits-all solution: Programs should accommodate varying pasture types, elevations, and grazing systems.

Timing matters:

- Late shutoff improves forage outcomes, less disruption.
- Early shutoff achieves greater water conservation but requires adaptation and may increase herd/pasture stress.
- Full curtailment is likely incompatible with pasture use.

We observed additional factors for producers to consider:

- Pasture fragility can persist into the year after irrigation reduction, especially with early or full-season cutoffs.
- Early shutoff and no-irrigation plots showed increased weed pressure and shifts plant communities, potentially complicating long-term pasture management.

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Affiliations: [1]Agricultural and Resource Economics, Colorado State University (CSU); [2]Western Colorado Research Center, CSU; [3]Conscience Bay Research, Boulder, CO; [4]Western States Ranches, Delta, CO.