

Key Facts

43% reduction in water availability for pastureland in non-drought years.

79% reduction in water availability for pastureland in 2015 drought.

Continuous water reductions prevents optimizing pasture productivity.

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For over 100 years, UC Cooperative Extension has developed and provided science-based information on agriculture production and natural resources to local audiences.

Biggs West Gridley Water District Irrigated Pasture

Irrigated perennial pasture is the foundation of livestock enterprises in the Sacramento Valley region. Irrigated pastures are typically seasonally grazed from May-November, then cattle are moved to annual rangelands. The access to irrigated pasture in California is important to completing forage needs for livestock grazing enterprises. These irrigated pastures are critically important in drought years when annual rangeland productivity has declined, and livestock producers need forage to sustain the operation.

To optimize irrigated pasture productivity, pasture operators in the region should irrigate lands every 10-14 days in the summer, with longer intervals between irrigations in the spring and fall. The irrigation scheduling is depending on evapotranspiration (ET), temperature, soil type, and soil water holding capacity.

Pastures have a shallow fibrous root system, with 90% of roots in top 12-18 inches, that is less equipped to access deep soil moisture than crops such as alfalfa with a root system up to 30 feet deep. Prolonged drought and a lack of adequate irrigation has both short- and long-term impacts on pasture productivity.

Policy Implications: Irrigated pasture is a minority land use within the Biggs West Gridley Water District (District) and for over 30 years, has been disproportionately impacted. The continuous reduction of water availability for irrigated pasture prevents water right holders from optimizing pasture productivity in the District. The 2022 water allocation process should consider the best available science for irrigated pasture production, and not be influenced by 3 decades of water limitations on irrigated pasture lands in the District.

Measuring Impact: UC Cooperative Extension reviewed historic irrigation allocation data for pastureland within the District along with Joint Water Districts. All entities, with water rights from the 1969 "Agreement on Diversion of Water From the Feather River" with the State of California, Department of Water Resources. From 1971-2020, considering non-drought years, irrigated pasture producers have seen a 43% (14 to 8 irrigations) reduction in water availability on land in the District. During a drought year when water reductions are allocated to District water right holders, irrigated pasture producers have seen a 79% reduction (14 irrigations to 3 irrigations) in water availability (2015).



Table 1: Historic Irrigated Pasture allocations in Biggs West Gridley Water District

Year	Irrigations	BWGWD Reference Source
1970	15-18	February 11, 1971 minutes
1987	13	March 13, 1987 Letter to Water Users
1990	13, additional irrigations, \$3 per acre, generally, at least every 14 days	Biggs West Gridley Resolution Adopting Water Conservation Program – approved May 10, 1990
1990	11 average	Yearly Comparison Chart 1980-1990
1990	7	1990 Diversions with 50% entitlement
1992	7	BWGWD Notice
2015	3	2015 Drought Year Water Allocation and Policy
2020	8	2020 Water Rates
2021	4	2021 Board Approved Summer Water Duties and Rates

Table 2: Date estimates of irrigation schedule for optimal pasture production.

Irrigation #	Date	Interval
1	April 21	Start
2	May 12	21 days*
3	May 29	18 days*
4	June 11	14 days
5	June 24	14 days
6	July 7	14 days
7	July 20	14 days
8	August 2	14 days
9	August 15	14 days
10	August 29	14 days
11	September 12	14 days
12	September 26	14 days
13	October 10	14 days
14	October 28	18 days***

*Typically lower ET
 ** Assumes winter rains, may request water in winter allocation in November.

Table 3: Water Allocations for Joint Water Districts

Year	Irrigations	Reference Source
2020	12	Butte Water District Policy
2021	6 (Drought)	Butte Water District - Water Shortage Allocation Policy
2015	9 (Drought)	Sutter Extension Water District Drought Policy

*Richvale Irrigation District has no private pasture

Estimated Economic Impact– Utilizing a recent (2015) University of California Cooperative Extension Costs of Returns study of irrigated pasture in Sacramento Valley, documents livestock forage productivity of irrigated pasture. It is reasonable to assume the value of \$40 AUM (Animal Unit Months) associated with irrigated pasture, considering supply and demand factors. Table 4 illustrates that under the current district policies with only 8 irrigations in a full water allocation year, it is estimated pasture landowners/irrigators lose \$180 per acre annually and under a drought scenario with only 4 irrigations they lose \$330 per acre. The District-wide economic impact of limiting pasture to 8 irrigations with 1,150 acres of pasture lands is estimated at \$207,000 annually.

Further Reading and Resources:

Orloff, S., Brummer, C., & Putnam, D. (2015). Drought Tip: Managing Irrigated Pasture during Drought.

Reed, B. et al. (2007). *Irrigated pasture production in the Central Valley of California* (Vol. 21628). UCANR

Forero, et al. (2015). Sample Costs to Produce Pasture. UCANR Publications.

<http://rangelands.ucdavis.edu/irrigated-pasture/>

Table 4: Livestock Carrying Capacity and Economic Impact Scenarios Based on Irrigations Allocated Per Season

Livestock Carrying Capacity Scenarios Based on Irrigations Allocated Per Season

***Simple AUM carrying capacity reduction based on reduced water %*

Sacramento Valley Irrigated Pasture Estimates - Full Water ~14 Irrigations	
10.5	AUM (Animal Unit Months) estimated livestock carrying capacity per acre
6	months - typical grazing season (Mid-May through Mid-November)
1.75	head of cattle per grazing season per acre

43% Reduction in Sacramento Valley Irrigated Pasture Estimates, ~8 irrigations (BWGWD normally)	
43%	reduction in irrigations
6	AUM (Animal Unit Months) estimated livestock carrying capacity per acre

71% Reduction in Sacramento Valley Irrigated Pasture Estimates, ~4 irrigations (2021)	
71%	reduction in irrigations
3	AUM (Animal Unit Months) estimated livestock carrying capacity per acre

79% Reduction in Sacramento Valley Irrigated Pasture Estimates, ~3 irrigations (2015)	
79%	reduction in irrigations
2.25	AUM (Animal Unit Months) estimated livestock carrying capacity per acre

Estimated Economic Value Per Acre	
\$40	Value per AUM (Animal Unit Months)
\$420	Full Water ~14 Irrigations
\$240.00	~8 irrigations (43%)
\$120.00	~4 irrigations (71%)
\$90.00	~3 irrigations (79%)