

Deficit Irrigation Practices on Alfalfa for Water Conservation in Southern California

Khaled Bali and Daniel Putnam
Irrigation/Water Management Advisor & Forage Specialist, UC Davis
UC Cooperative Extension-Imperial County and UC Desert Research & Extension Center
<http://ceimperial.ucanr.edu>
E-mail: kmbali@ucanr.edu

INTRODUCTION

Alfalfa is the largest water user crop in the state of California grown on approximately one million acres of irrigated land. Alfalfa is the dominant crop in the low desert region in California where more than 170,000 acres of alfalfa are using in excess of one million acre-feet of Colorado River water per year. Alfalfa crop water requirements in the low desert are in excess of 6 acre-feet/acre per year. Almost 40% of this water is used during the summer season during which alfalfa yield and quality are low. Deficit irrigation of alfalfa during the summer could be used to improve alfalfa water use efficiency and conserve water.

OBJECTIVE

The objective of this project is to develop a new alternative for water conservation in the low desert region.

DESIGN

The impacts of two deficit irrigation practices on alfalfa yield and consumptive water use were used to estimate water savings associated with this new practice. The two deficit irrigation strategies (Deficit A; no irrigations in July, August, and September and Deficit B; no irrigations in late July, August, and September) were implemented on four commercial sites in the low desert region of California.



CONCLUSIONS

Summer Deficit irrigation practices in Southern California could be used to conserve approximately 2 ac-ft per acre.

Water saving figures should be based on the ET of unstressed and fully irrigated alfalfa during the period of interest.

Production costs saving associated with Deficit irrigation are similar to the costs of reseeding that may be needed in the fall to restore Deficit alfalfa Fields.



Table 1. Summary of irrigation treatments and water savings

Irrigation treatment	Number of irrigations	Water saved (inches)	Total summer yield loss (tons/ac)
Full irrigation	6	0	0
Deficit A	0	22.7	2.16
Deficit B	1	19.5	2.16

Table 2. Average value of conserved water

Value of conserved water	Hay price (\$/ton)		
	\$100/ton	\$150/ton	\$200/ton
\$/ac-ft of conserved water	\$114	\$171	\$228
\$/acre (22.7 inches of water)	\$216	\$324	\$432

