

Crop Water Productivity of Alfalfa Under Different Cutting Schedules

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Abdelmoneim Mohamed (Moneim) is a project scientist at Kearney Agricultural Research and Extension Center conducting research to identify the best irrigation management practices on alfalfa to enhance water use productivity while minimizing environmental impacts. The project focuses on crop growth and agronomic performance as affected by irrigation management, salinity, and other factors. He is an irrigation extension specialist with more than 9 years of research and extension experience in irrigation and agricultural water management.

After receiving his Ph.D. at Washington State University, he was an irrigation engineer for WSU Skagit County Extension Center working with extension agents and growers on improved irrigation practices, irrigation systems efficiency evaluation, and crop water use efficiency.

His professional interests include: (1) formulating engineered solutions and developing new strategies for agricultural water management challenges to maximize water use efficiency, (2) teaching farmers and extension educators about improved irrigation practices, irrigation systems efficiency evaluation, and crop water use efficiency, (3) developing education programs for growers, professionals, and stakeholders.

Keywords: alfalfa, crop water productivity, cutting schedule

Alfalfa (*Medicago sativa* L.) is the most commonly grown forage crop in the USA. It is also one of the largest water users in California but with high forage production capacity. However, meeting crop's water demand has been challenged by increased competition for water resources between agriculture and urban uses, the recurring drought, and declining groundwater levels in California. Diverse strategies are required to increase alfalfa's water use efficiency, sustainability, and profitability; and one of the potential strategies is adapting best agronomic and water management practices. Efficient water savings measures are needed to maintain alfalfa hay productivity to meet the growing demand of alfalfa hay from dairy industry nationally and globally. A field study was conducted at the University of California Kearney Agricultural Research and Extension Center (KARE), Parlier, California in 2017-2021 to examine Crop Water Productivity (CWP) of alfalfa using different cutting schedules. Cutting schedules were normal cutting (28 days between cuttings), staggered cutting (alternating 21 and 35 days), and late cutting (35 days). A Randomized Block Design experiment with four replicates was used. Non-limiting irrigation water was applied to all plots. Potential evapotranspiration of alfalfa was calculated using the Basic Irrigation Scheduling (BIS) model. Alfalfa CWP in conjunction with cutting schedules were determined. In general, late cutting had the highest seasonal CWP (15.8 Kg ha⁻¹ mm⁻¹; 13% more than normal cutting and 8% more than staggered cutting) averaged over the four years. The potential and prospective challenges of each cutting schedule are determined and will be discussed during the presentation as a tool for growers to select the appropriate cutting schedule for maximizing crop water productivity and for best irrigation water management practice.