# Irrigation Frequency & Cutting Schedules Effect on Crop-Water Productivity & Quality of Alfalfa Variety in California's Central Valley

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# Flood irrigation and cutting schedules management in alfalfa production

Generally, alfalfa is irrigated once (**n**on-**f**requent **i**rrigation: **NFI**) per cut (28 days basis) with flood irrigation system because of field drying time requirement for harvesting operations.

This irrigation practice may limit alfalfa from attaining it's yield potential.

## Objective:

Determine irrigation frequency by cutting schedule combination treatments effect on yield, crop water productivity (CWP) and forage quality of alfalfa variety.

# Material and Methods

- **Study location:** USDA-ARS, Parlier CA; Planted in 03/18/2021.

- **Experimental design: Split-plot**. 4 reps
  - **Main plot**: Irrigation by cutting schedule combination treatments (**F**requent **I**rrigation: **FI**-28d cut, **N**on-frequent, **N**FI-28d cut, and FI-35d). NFI- one irrigation per cut (6") a week after cutting while FI treatments received irrigation weekly based on evapotranspiration (ET) values at 110% ET level. Irrigation treatments imposed after Cut 1 (06/23/2021).
  - **Sub-plot** : 10 Cultivars of 8-10 Fall dormancy (FD). HVX840RR (reduced-lignin); AFX1060, AFX960, Magna (HiGest); Nexgrow6829RR, SW10, SW6330, Saltan, QA19NTC683, CUF101 (conventional).

    Applied water use (irrigation + rainfall): 1325.5 mm (1254.8 mm + 70.7 mm) for FI-28d and FI-35d and 1206.1 mm (1135.4 mm +70.7 mm) for NFI-28d treatments.

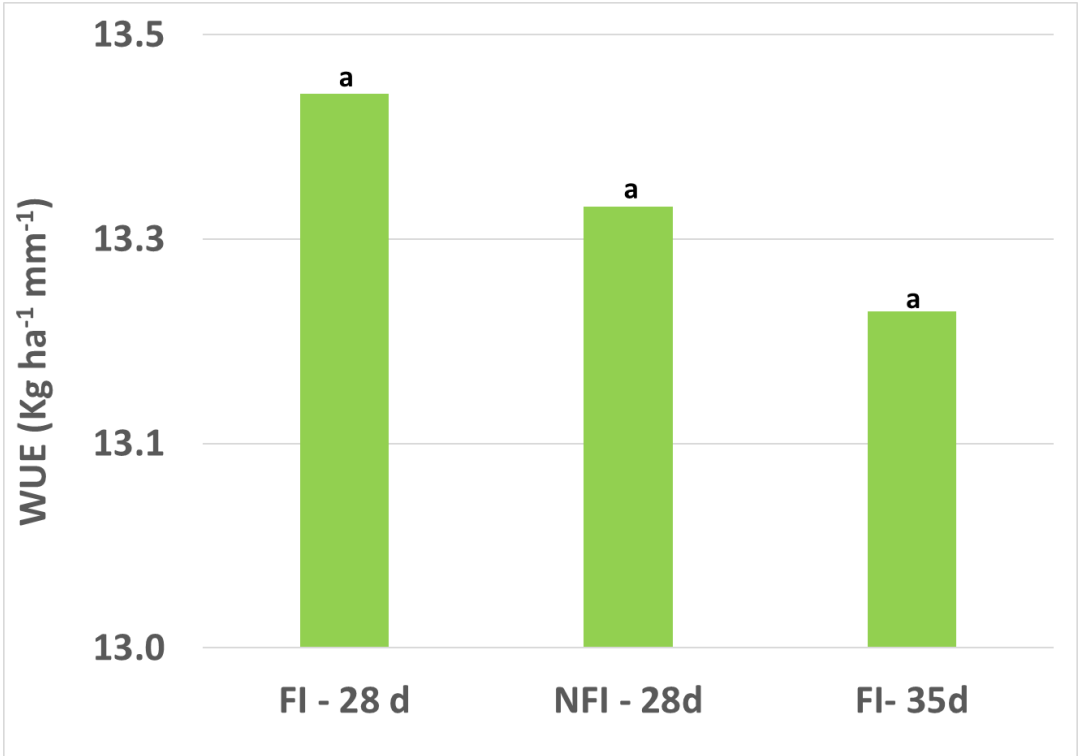
**Data:** Forage yield, applied water use & efficiency, and forage quality.

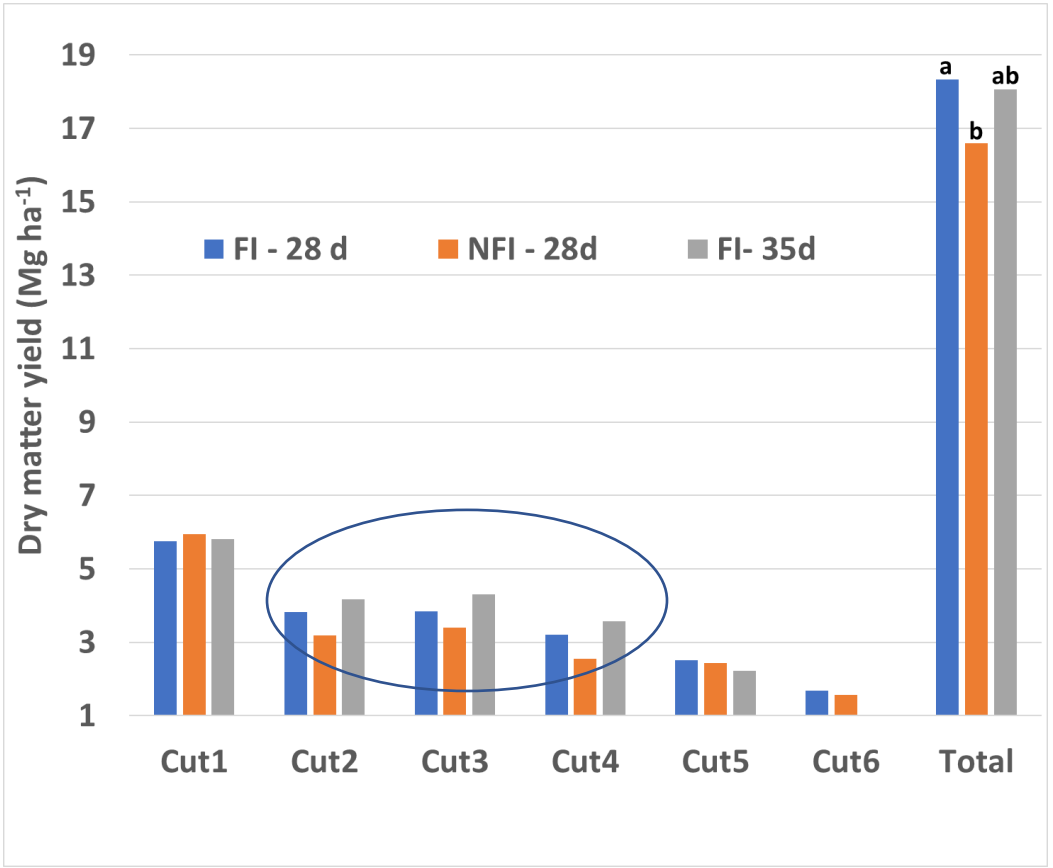
NFI-28d, FI-28d, FI-35d

# Results-Yr 1

**F**requent **i**rrigation (**FI**) of 28d and 35d cutting schedule treatments resulted in greater yields than **n**on-frequent (**NFI**) 28d schedule in Cuts 2, 3 and 4 but no difference between treatments in Cut 5 and 6.

Regardless of irrigation frequency and cutting schedules, the first three cuts contributed the most to total seasonal yields in all treatments (67, 69, and 73 % in NFI-28d, FI-28d and FI-35d, respectively).



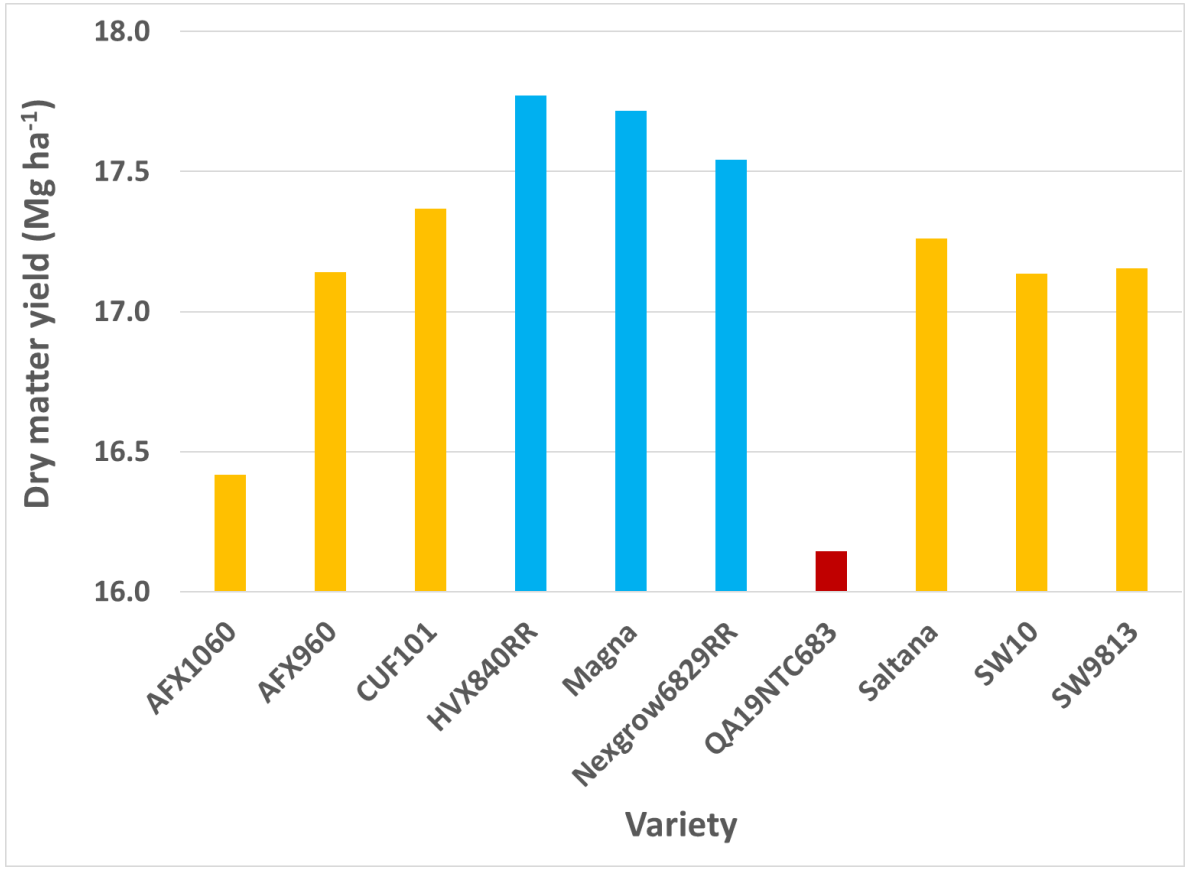




NFI-28d cutting schedule treatment produced a slightly lower seasonal yield but similar in WUE as FI-28d and FI-35d treatments with applied water use saving by 9 %.

# Results

In general, response of varieties to irrigation by cutting schedule treatments were similar (average yields of varieties ranged from 16.1 to 17.8 Mgha$^{-1}$).

Highest yields were produced by varieties 'HVX840RR', 'Magna' and 'Nexgrow6829RR' while the lowest yield was for 'QA19NTC683' (experimental line).




This is first year results and data of multiple production years will be collected to draw a conclusion about irrigation frequency by cutting schedule combination treatments impact on alfalfa's yield, crop water productivity and quality.