

# Salinity Tolerance & Forage Quality Comparison for Four Varieties of Alfalfa (*Medicago sativa*)

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Alfalfa is an important forage and the most valued hay crop for California's dairy industry which leads the nation in milk production. Statewide, alfalfa was grown on 208,413 hectares in 2020 (USDA-NASS, 2020), down from 404,686 hectares in 2006. California alfalfa yields average 15.9 metric tons/hectare, nearly twice the U.S average, due to a long growing season that allows for more cuts per year and to breeding efforts to address changing conditions in climate, water availability and soil quality (Geisseler and Horwath, 2016). With increasing drought and irrigation water scarcity, lower quality irrigation waters that are often saline are increasingly used for forage irrigation, as our marginal soils, higher in salinity. Alfalfa seed companies have foreseen this trend and invested considerable resources into breeding more salt tolerant varieties. In this experiment, four alfalfa (*Medicago sativa*) cultivars are being evaluated at five irrigation water salinity levels (0.5, 5, 10, 15, 20 dS/m EC<sub>w</sub>, mixed salt solution) using a split plot design. A companion seed germination test is also being conducted. The cultivars include two newly licensed varieties from Barkley Seed, Inc. (B6604-0588F, B6269 SR), a salt tolerant control (AZ90NDCST) and a public control (CUF101). The seedlings were established under non-saline conditions and grown in large pots (19 liter) filled with a 60:40 mix of clay loam soil and sand. Nutrients (equivalent of full-strength Hoagland's solution) are added to the irrigation water in a recirculating system in which all drainage returned to the 379 liter irrigation tank for each salinity level. solution. Once salinization began, the plants were cut to the crown and then harvested every 3 to 4 weeks, just prior to flowering in the controls. Dry matter yield, shoot Na<sup>+</sup> and K<sup>+</sup> accumulation, and seed germination data will be presented.

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