Subsurface Drip Irrigation, Deficit Irrigation Strategies, and Improved Varieties to Improve Alfalfa Water Use Efficiency Under Drought Conditions – Dan Putnam, University of California-Davis ($156,254)

Objectives:
Alfalfa is often the largest water user in most western states, and may be most affected by water deficits caused by climate change, water transfers to cities, environmental demands for water, or periodic droughts. Additionally, there is a strong need to develop improved technologies of irrigation, specifically Subsurface Drip Irrigation (SDI), along with development of appropriate varieties for water deficits. The goal of this proposal is to ensure the sustainability of alfalfa production in the western U.S. through 1) characterizing deficit irrigation strategies, 2) developing the capability for subsurface drip irrigation, and 3) evaluating current, and developing future, alfalfa varieties and germplasm which are compatible with drought and deficit irrigation strategies, and in particular the use of SDI. Specific objectives are to: 1. Identify and evaluate the technical and economic viability of deficit irrigation management practices that can optimize alfalfa forage production while conserving water under limited supply. 2. To quantify alfalfa cultivar interactions with deficit irrigation practices in terms of yield response and persistence, and to develop new alfalfa germplasm with improved yield potential for deficit irrigated environments. 3. To document the performance, water savings, and yield response of alfalfa grown under Subsurface Drip Irrigation (SDI) on Farmer’s Fields and in controlled studies. 4. To conduct extension activities on water management, SDI, and to develop a ‘learning network’ for irrigation management and use of SDI in alfalfa.