

## Sustainable Forage Systems Specialist

**Developed and proposed by:** Three Program Teams identified the Sustainable Forage Systems Specialist position as a top priority: Agronomy, Dairy Production, and Rangeland and Grazing Systems. The position is also a priority for the Department of Plant Sciences at UC Davis and for the Intermountain, Westside, Kearney, and Desert Research and Extension Centers. These stakeholders helped define the statewide need, priority regions, research infrastructure, and extension network needed for the position. External input and support were provided by the California Alfalfa and Forage Association (written support available on request), reflecting urgent industry need for renewed UC leadership in forage systems.

**Position title:** Sustainable Forage Systems Specialist (UCCE Specialist)

**Headquarter location and coverage area:** The position will be headquartered in the Department of Plant Sciences at UC Davis, with statewide coverage. UC Davis provides a uniquely strong base for a forage systems program through expertise in forage breeding, crop management, water and soil resources, pest management, plant pathology, ecology, animal science, and agricultural economics. The campus provides access to field research facilities, shared agronomic equipment, a forage quality laboratory, and collaborators across plant, animal, environmental, and economic disciplines. Statewide coverage is essential because forage crops are grown across California's intermountain, Central Valley, desert, coastal, and mixed crop-livestock regions and are linked to dairy, beef cattle, hay, grain, pasture, water, nutrient management, and working-landscape outcomes.

**Position overview, briefly describe:** The specialist will provide statewide leadership in alfalfa and other forage crops important to California dairy, livestock, and diversified agricultural systems. The program will emphasize forage crop agronomy; sustainable production systems; irrigation, salinity, and climate adaptation; pest and disease management; soil health; forage quality; and linkages among crop production, livestock nutrition, and whole-system resource-use efficiency. The candidate should have a Ph.D. in agronomy, crop science, agroecology, plant sciences, or a closely related field, with demonstrated capacity to lead field-based applied research, develop effective extension programs, and collaborate across disciplines. The position will be based in the UC Davis Department of Plant Sciences and will work closely with county-based UCCE academics, Program Teams, Research and Extension Centers, Research and Information Centers, the California Institute for Water Resources (CIWR), the Sustainable Agriculture Research and Education Program (SAREP), and external forage, dairy, livestock, agency, and conservation partners.

**Justification:** Profitable and sustainable forage systems sit at the intersection of several of California's highest-priority agricultural and environmental challenges: sustaining dairy and livestock production, adapting to water scarcity and climate change, and managing nutrients and manure to protect soil, water and air quality. Diverse forage and feed crops are grown on more than 1.5 million acres annually, generate over \$1.7 billion in direct farmgate value, and support the state's dairy and cattle industries. Alfalfa, grasses, hay crops, cereal forages, and irrigated pastures also influence groundwater demand, wildlife habitat, open space, carbon and nitrogen cycling, soil conservation, pesticide use, and the viability of many other cropping systems.

The position addresses three linked needs. First, California needs climate- and water-resilient forage systems that maintain yield, quality, and profitability under drought, salinity, heat, and increasingly variable water supply. Second, producers, consultants, agencies, and allied industries need better integration of forage agronomy with dairy and livestock nutrition, manure management, water quality, soil health, and farm economics. Third, UC ANR currently lacks a statewide CE Specialist responsible for the full breadth of forage systems, limiting coordinated applied research, synthesis, and extension support for UCCE Advisors, growers, consultants, livestock industries, and agency partners.

This position directly supports UC ANR Strategic Vision 2040 by advancing sustainable agriculture, resilient ecosystems, thriving communities, and economic prosperity through science-based, collaborative solutions. It especially aligns with Strategic Vision 2040 priorities in agriculture and food systems, natural ecosystems and working landscapes, climate change, innovation, and regulations/policy/compliance. Near-term outcomes will include stronger statewide research coordination, improved access to science-based forage management recommendations, expanded decision support for water and salinity management, and greater integration of forage quality and livestock-system outcomes into agronomic recommendations. Over 20 years, success will mean California forage systems remain economically viable while using water, nutrients, land, and pest-management tools more efficiently; contribute to improved soil and water quality; reduce the environmental footprint per unit of forage and livestock product; and strengthen the resilience of agricultural communities facing drought, salinity, climate extremes, and regulatory change.

**Extension:** The specialist will lead statewide extension programming for sustainable forage systems that supports growers, dairy and livestock producers, crop consultants, pest control advisers, irrigation and nutrient-management professionals, conservation partners, agencies, and allied industries. Core activities will include: 1) leading the Western Alfalfa and Forage Symposium—the premier forage meeting in the US, contributing to field days, grower meetings, REC demonstrations, and providing training for consultants and agricultural professionals; 2) maintaining and expanding web-based resources through UC Agronomy and Rangeland Research and Information Centers and related forage platforms; 3) producing practical publications, field trial reports, decision tools, and management guidelines; and 4) developing extension approaches that connect UC research to stakeholders across irrigated forage, pasture, dairy, livestock, and working-landscape systems. Emphasis will be placed on actionable guidance for irrigation and salinity management, pest and disease management, forage quality, soil health, nutrient cycling, crop-livestock integration, and climate adaptation.

**Research:** The specialist will develop an applied, field-based research program to improve the productivity, resilience, profitability, and environmental performance of California forage systems. Research will focus on reducing environmental impacts while maintaining or improving yield, forage quality, and economic viability under changing environmental and regulatory conditions. Key research areas include: 1) Climate- and water-resilient forage production, including evaluating forage species, varieties, rotations, irrigation strategies, and management systems for drought, heat, salinity, variable water supply, and emerging pest and disease pressure; 2) Water, salinity, soil, and nutrient management, including quantifying forage impacts on water-use efficiency, groundwater demand, manure integration, nitrogen and carbon cycling, soil conservation, soil health, and water quality; 3) Crop-livestock system integration, including linking agronomic management to forage quality, dairy and livestock nutrition, feed efficiency, manure management, environmental outcomes, and market value; 4) Diversified forage markets and future uses, including assessing opportunities such as alternative forage species, biomass crops, cellulosic bioenergy, alfalfa protein, and other emerging markets that could improve the resilience of forage production under changing water and land-use constraints.

The next 20 years will require research that responds to climate change, water scarcity, salinity, pest and disease shifts, feed-system vulnerability, nutrient and greenhouse gas expectations, and increasing regulatory complexity. The specialist will work across disciplines with UCCE Advisors, growers, consultants, agencies, industry organizations, forage breeders, irrigation scientists, livestock nutritionists, soil scientists, plant pathologists, entomologists, agricultural economists and climate scientists. Outputs will include UC ANR peer-reviewed publications, management guides, decision-support tools, field trial reports, extension briefs, cost and production information, and peer-reviewed

scientific articles in agronomy, crop science, agricultural water management, forage systems, animal nutrition, soil science, and agroecosystems journals.

**UC ANR network:** This position would significantly amplify UC ANR capacity by creating a statewide coordinating node for a high-value, cross-sector agricultural system. The need spans at least three Program Teams, demonstrating that this is not a single-commodity or single-discipline position. Rather than duplicating existing expertise, the specialist would integrate field crop agronomy, forage quality, livestock production, soil and water management, pest management, agricultural economics, climate resilience, and extension delivery.

The specialist will collaborate with AES and non-AES scientists, UCCE Specialists, UCCE Advisors, REC directors and staff, and statewide programs including the CIWR and its Climate Smart Agriculture program. Early-career collaboration opportunities include statewide variety evaluations, forage nutrition assessment, forage breeding and germplasm development, irrigation and salinity trials, pest and disease management, biomass crop research, soil-health studies, and REC-based demonstrations. UC Davis provides strong campus linkages and the REC network provides statewide field capacity across major forage-producing environments.

California currently lacks statewide academic leadership across the full forage systems portfolio—leaving the work distributed without a clear integrative home. Current expertise is spread across multiple counties, campuses, RECs, and disciplines, but no single position provides the critically needed statewide integration across forage agronomy, forage quality, water and salinity management, soil health, pest and disease management, livestock nutrition, and environmental outcomes. Filling this gap will improve UC ANR's ability to coordinate multi-location research, support county advisors, respond to stakeholder needs, maintain a coherent extension knowledge base, and provide science-based input on water, nutrient, pesticide, land-use, and climate issues.

**Network external to UC ANR:** The specialist will work with partners in forage production, dairy and livestock systems, water and natural resource management, agricultural policy, and national forage research and extension networks. Key partners include the California Alfalfa and Forage Association (contributed to the development of this proposal), California forage growers, irrigated and non-irrigated pasture ranchers, dairy and livestock producers, crop consultants, pest control advisers, commodity organizations, conservation organizations, and state and federal agencies. The position will have regional and national relevance through the Western Alfalfa and Forage Symposium, National Alfalfa & Forage Alliance programs, USDA-ARS, USDA-NIFA, the California Department of Water Resources, the California Department of Pesticide Regulation, and other partners concerned with water, soil, biodiversity, pesticide use, climate resilience, and agricultural viability.

**Support:** The Department of Plant Sciences and UC Davis College of Agricultural and Environmental Sciences will provide a strong support base. The position will have access to UC Davis transportation resources, campus office space, field research facilities, shared agronomic equipment for planting and harvesting, a forage quality laboratory, and collaborating units in co-located departments and programs. UC Davis and the UC ANR Research and Extension Center network provide subsidized access to agronomic research stations that can support statewide field experimentation.

**Other support:** The position will be competitive for external support from forage-specific and natural-resource funding sources, including the USDA-NIFA Alfalfa & Forage Systems Program, National Alfalfa & Forage Alliance Checkoff funds, California Alfalfa Forage Research Foundation, USDA-ARS cooperative agreements, California Crop Improvement Association collaborations, California Dairy Research Foundation, and state and federal programs focused on irrigation efficiency, drought adaptation, salinity management, water quality, soil health, climate resilience, and whole-farm sustainability.