

## **Position Title:** Area Orchard Systems & Weed Ecology Advisor

**Position: Briefly describe:** The advisor will serve the major industries of walnut, prune, almond and olives with a research and education program focusing on weed ecology and management in these systems. A Master's degree or higher in plant science, pomology, weed science, horticulture, or a related field is required. The position will be based in Glenn County and provide cross county support in orchard weed science to Tehama and Colusa counties. Additionally, the position will cover walnuts in Colusa County.

**Justification:** The northern Sacramento Valley counties of Glenn, Tehama and Colusa have seen exponential growth of orchard crop systems over the past decade with nearly 270,000 bearing acres valued at over \$975 million between the three counties. The vast majority of this growth is among growers who are new to tree crop production and in soils and microclimates without a history of tree crop production. The majority of these are young orchards and, as they mature, the complex set of management problems for which growers will need both research and extension to sustain production will naturally increase, while at the same time external forces of climate change, increased pest pressure, drought, decreased water quality and availability will increase in all three counties over the next several years, especially in almond and walnut.

Weed biology, ecology and management in orchard crops has been underserved, with only one Weed Management Specialist covering 3.8 million acres of perennial crops, and no advisors explicitly charged with or experienced in weed research. This limits research-based information on integrated pest management approaches to weed management, resulting in herbicides being, pound for pound, the most applied pesticide in these systems. Weed control centered around advanced computing and sensing, automation, Lidar, and other quickly evolving technologies is a huge opportunity for decreased pesticide use and increased rural innovation. Weed management research and extension has recently been articulated as one of the top three priorities of the Almond, Pistachio, Prune and Walnut Boards.

With the current structure of Orchard Advisors (existing and in recruitment) in the Northern Sacramento Valley, there is still **no** CE Advisor coverage of olives in Glenn, Tehama and Colusa counties, whereas historically the advisor serving these counties was one of the lead researchers on olive production in California and internationally. There is no advisor for the 24,000 acres of walnuts in Colusa County or weed management in any crop except rice in all three counties. Maintaining the ecological and environmental viability of these high-value orchard crops is critical to sustaining the region's rural economies. This position supports the priority hiring theme of a Food Systems Resilience Network by supporting the production of healthy food in the region. This advisor would address the ANR Condition Changes *Promoting economic prosperity in California* by improving agricultural efficiency and productivity and *Protecting California's natural resources* by improving the management and use of land and increasing ecological sustainability of food systems and natural ecosystems and improving water quality and water use efficiency.

**Extension:** The position will have eager audiences of orchardists in all three counties who traditionally attend UCCE workshops, field days, and outreach events in high numbers. Beyond growers, allied industry including pest control advisors, consultants, farm supply companies and local and state agencies are eager for extension opportunities. The emphasis of these programs will be on weed ecology and management, emerging technologies, production systems management, cover cropping and economics. The Nickels Soil Lab, which hosts numerous UC research projects and regular extension field days, will be powerful demonstration tool at this advisor's disposal. The advisor will contribute to the well-read and oft-quoted Sacramento Valley Orchard newsletters. Additional outlets for written extension materials are commodity board reports, trade magazines, the UC Weed blog, UC's SacValleyOrchards.com site and associated Twitter account, UC's GrowingTheValley podcast, and other online media tools as they emerge.

**Research:** The position will engage in a robust research program in collaboration with surrounding area advisors and campus-based specialists. Weed ecology topics that need research attention are emerging control

technologies, avoidance and management of herbicide resistance, drift, biocontrol and reduced pesticide inputs. Orchard production research topics including the use of cover crops, variety selection, advancing technologies for the mechanical harvesting of olives, labor reduction practices, pruning methods, nutrient management to maintain healthy drinking water, irrigation management with decreased water availability and increased salinity and more. The balance of orchard systems management with weed control challenges is a unique challenge that will offer significant research opportunities. Peer reviewed publication outlets include Acta Horticulturae, Hort Science, Hort Technology, Invasive Plant Science and Management, and Weed Science, in addition to ANR publication opportunities.

**ANR Network:** Beyond filling current gaps in orchard system and weed ecology needs, this position would significantly augment the capacity of the ANR network as a step in a succession planning effort relative to management of the Nickels Estate in Colusa County. Currently, Advisor Niederholzer is responsible for oversight of this facility, but no other Advisors in the Sacramento Valley are positioned to take over the responsibility in future years. The advisor would work in close collaboration with the tightly knit Sacramento Valley Orchards advisors group of Luke Milliron (orchards based in Butte), Franz Niederholzer (Almonds & Prunes/CD based in Colusa), Kat Jarvis-Shean (Sacramento, Solano and Yolo Counties), Curt Pierce (northern Sacramento Valley irrigation advisor) and to be named Advisor (orchards based in Tehama), which meets quarterly to co-author the Sac Valley Orchard newsletter and support SacValleyOrchards.com. Weed science projects would be a collaborative effort with Specialist Brad Hanson, and other UC advisors in the Sacramento Valley who do not have weed management expertise. Collaborative efforts with the UC Davis Olive Center, UC Davis Fruit and Nut Center, Pomology Program Team, Pest Management Program Team, UC Davis Dept of Ag Engineering are expected.

**Network External to ANR:** Pest control advisers, crop consultants and on-farm cooperators will be an integral part of the extended network for this position. The Almond, Olive and Walnut Commodity Boards have expressed the desire to work with an Advisor in this position and local allied industries have traditionally been key members of previous advisors' networks. CDFA programs, including Healthy Soils (HSP) and State Water Efficiency and Enhancement Programs (SWEET) would benefit from the Advisor's work in topic areas that address carbon capture (cover cropping, compost applications, etc.) and water efficiency. The Department of Pesticide Regulation (Spray Safe Program), local Resource Conservation Districts (HSP, cover cropping), and noxious weed control programs in the counties would be a part of the Advisor's network.

**Support:** County and research support are already available for this position in Glenn County. This includes a vehicle that can be driven across counties, fuel, currently vacant private office space, research equipment, storage, lab, and clerical support. County support has been very stable and anticipation for this position is high.

**Other support:** All of the major horticulture crops have research support boards designed to fund ground breaking work in orchard systems. It is fully anticipated that the incumbent would be able to attain research and even research assistant support funding if desired. Previous weed management advisor positions have been well supported by local agriculture service industry. Funding opportunities from USDA, CDFA, DPR and Western IPM center would be well aligned with this position. The Almond, Pistachio, Prune and Walnut Boards have pinpointed weed management research and extension as one of the top three priorities needs in their industry that they want to support.

**Headquarters and Coverage Area:** Headquartered at UCCE Glenn County, serving Tehama and Colusa Counties for weed ecology and Colusa County for walnut production.

**Developed and proposed by:** This position was developed by the County Directors in Glenn, Tehama and Colusa Counties, in close consultation with the Pomology program team and the Weed workgroup. Local stakeholders including growers, Farm Bureau, Resource Conservation District, Ag Commissioner and Natural Resources Conservation Service were consulted and contributed to the proposal.