

2021 UC ANR CE Position Template

Position Title: CE Specialist in diseases of nursery, greenhouse, and native crops

Position: This position focuses on diseases of nursery and greenhouse plants including native plants for ecological restoration, ornamentals, vegetable transplants, and hemp/cannabis. There will be an emphasis on disease diagnosis, epidemiology/ecology and management of emerging diseases via clean plant networks and development of IPM strategies. There will also be strong water scarcity adaption and pesticide regulation components. The position directly addresses the ANR Strategic Initiative on invasive and emerging endemic pests. At UC Davis, the specialist will collaborate with faculty in Plant Pathology, Plant Sciences, Land Air and Water Resources, and Environmental Toxicology as well as Foundation Plant Services and the UC Davis Cannabis Research Center. There will be extensive opportunities to collaborate with and support UC ANR advisors in environmental horticulture, vegetables, IPM, and other disciplines as well as external stakeholders, commodity groups and state and federal agencies. The position requires a PhD in plant pathology or related field. Experience with nursery/greenhouse diseases is required.

Justification: UC Plant Pathology specialists provide critical support not only in research and outreach but, uniquely, via disease diagnosis services, thereby filling a role that in most other states is provided by a dedicated land grant-based diagnostics lab. CA nursery and floriculture industries have a farm gate value of \$3.73 billion (annual average 2013-2017) and \$3.74 billion in 2019, accounting for over 20% of U.S. production from 2,609 operations. In CA, only dairy and milk, almonds, and grapes have higher farm gate economic values. The industry includes plants for ecological restoration, ornamentals, vegetable transplants, and hemp/cannabis. The nursery/greenhouse industry currently has no CE specialist support, despite having over a dozen farm advisors. There is a critical gap for disease diagnosis support, as well as innovative research and outreach to adapt to this ever-changing industry.

This position is proposed in response to increasing issues with new pathogen introductions into native ecosystems via contaminated nursery stock. In addition, new disease challenges are also occurring in the growing nursery vegetable transplant industry and closed hemp/cannabis production systems (transplant and bud production). Many emerging disease problems start in nursery/greenhouse operations and then spill over into agriculture and natural ecosystems, with severe impacts on food systems and natural resources. This is particularly problematic for fungal pathogens, which are not included in currently operating clean plant networks. For example, sudden oak death emerged out of the California Nursery industry. Foundation Plant Services (FPS) at UC Davis is solely focused on viruses and does not include native plants ornamentals beyond roses (100+ species). There is currently strong external momentum (USDA Forest Service, Local restoration agencies across the state) to create a clean native nursery crop program on the UC Davis campus, which we would like to have a specialist involved in coordinating. Basing this position at UC Davis provides strong opportunity to expand current FPS networks. UC Davis is also the location for most current specialist diagnostic labs.

Further, the recent development of the vegetable transplant industry and hemp/cannabis production in closed system environments has resulted in emergence of many new diseases challenges. There are increasing water-scarcity issues which result in pathogen spread and enhanced losses. There are also increasing pesticide regulations. These producers have no one to provide best management practices for management or decision support, notably diagnostics and pathogen monitoring.

Extension: Because diseases in nurseries and greenhouses impact a wide array of plant species, this position would cut across native plant crops (including nurseries and native systems), food industry (e.g., vegetable transplants), ornamentals, and herbal crops (e.g., cannabis). The specialist will provide diagnostics of emerging diseases as well as consultation and outreach around management options. For nurseries and greenhouses, outreach activities would also include development and maintenance of accreditation programs to meet new regulations. In addition, the specialist would provide a link between

the emergence of nursery/greenhouse diseases and the field/landscape where growers and restoration ecologists may encounter these diseases. The position also fills gaps in master gardener programs by providing disease management and diagnosis support for landscape plants.

Research: Key areas for research include pathogen discovery, development of improved diagnostics and detection tools, clean plant production methods, hazard assessments for critical control points, water-disease co-management for water scarcity adaptation, management to minimize pesticides and reduce pesticide residue and release in the environment. Hemp/cannabis is likely to emerge as a major part of the position as most diseases are currently undescribed. Possible outlets for publication of research include UC IPM disease webpages (creation or updates) for crop groups (tomatoes, cucurbits, cannabis, >100 ornamental crops, native crops); RIC sites; ANR CE newsletters; technical journals (e.g., Plant Disease, Phytopathology, HortScience).

ANR Network: This position would complement and support advisors and specialists in many areas as nurseries and greenhouses are a key pathway to pathogen introductions. We see this position especially working with Environmental Horticulture Program team and CE advisors for horticultural and vegetable crops. In particular, the position would offer diagnostic support and development of disease management and environmental impact-mitigation techniques that will link to other work on production, water use, environmental toxicology and restoration. It is a priority of the Environmental Horticulture Program Team. But the position will also link to many field-based advisors and specialists since this position represents a primary intersection of disease introduction, pesticide regulations, and water use.

Networks External to ANR: As part of the California Forest Pest Council, the Phytophthoras in Native Habitats Work Group was created (www.calphytos.org) to provide disease information to native plant nursery growers. Additional state and federal networks include CDFA, DPR, DWR, county agricultural commissioner personnel, APHIS, and ARS. External stakeholders include native crop growers groups, ornamental nursery crop growers, vegetable transplant cooperatives, cannabis co-ops and farm cooperatives.

Support: The Department of Plant Pathology, UC Davis will supply business, IT, and travel support through normal process and access to our diverse facilities (including the Armstrong Farm, Foundation Plant Services and college managed greenhouse space), networks, and industry partners.

Other support: Recent efforts have demonstrated that there are new, viable funding sources that the person will be able to compete for to support their program. This is especially true for issues around vegetable transplant nurseries. Sources of funding may include: CDFA, DPR, USDA NIFA, USDA Forest Service, USDA APHIS, California nursery and greenhouse alliance, Melon Board, chemical companies, transplant houses, as well as local agencies tasked with ecological restoration (e.g., Santa Clara Valley Water District, San Francisco Public Utilities Commission).

Headquarters and Coverage Area: The position will be located in the Department of Plant Pathology, UC Davis. The programmatic area is state-wide. UC Davis is well positioned to collaborate with environmental horticulture and pest management advisors scattered through-out the state

Developed and proposed by: This position was developed by the Department of Plant Pathology, UC Davis with input from the Pest Management Program Team, Environmental Horticulture Program Team (Janet Hartin), and comments by the Invasive and Emerging Endemic Pests Strategic Initiative. Jim Farrar was instrumental to framing this position and articulating diverse funding sources. Discussions were also conducted with Deanne Meyer, leader of the Sustainable Food Systems Strategic Initiative.