

Office of the President

TO MEMBERS OF THE COMMITTEE ON EDUCATIONAL POLICY:

DISCUSSION ITEM

For Meeting of May 15, 2013

INVESTING IN CALIFORNIA: THE UNIVERSITY OF CALIFORNIA'S DIVISION OF AGRICULTURE AND NATURAL RESOURCES

EXECUTIVE SUMMARY

The University of California's Division of Agriculture and Natural Resources (UC ANR) is a critical link between local issues and the power of UC research. With programs in every county in California, UC ANR provides science-based information to families, farmers, ranchers, and policy makers. UC ANR solves problems and addresses important issues facing California:

- UC ANR led a multistate research coalition that discovered new strains of downy mildew fungus to help protect California's \$156 million spinach industry – the largest in the nation.
- Recent studies have found widespread nitrate contamination in some of California's groundwater systems. UC ANR is working with multiple California agencies to create a curriculum and training program to assist certified crop consultants and growers with their management of nitrogen fertilizers and irrigation water.
- Nutrition educators are engaged in efforts to stem the epidemic of childhood obesity.

As with most parts of the University, UC ANR has been challenged by the current budget situation. It is particularly challenged with sustaining sufficient numbers of Cooperative Extension Specialists and Advisors. Over the past ten years UC ANR has seen the number of retirements increase and has been unable to keep pace with new hires. Vacant positions were eliminated as part of the strategy to meet budget reductions and the growing costs of benefits and the retirement system. Since 2000, UC ANR has seen a 38 percent decrease in academic personnel and a 39 percent decrease in staff.

Nonetheless, with its network of researchers and extension personnel, spanning the state from the Oregon border to the Imperial Valley, UC ANR has been directly engaged with California's communities for over 100 years, and is well positioned to continue providing the cutting edge research that will address the emerging challenges that California is going to face in the next 100 years.

BACKGROUND

Introduction

In 2012 the nation celebrated the 150th anniversary of the Morrill Act, an act of vision and courage by President Abraham Lincoln that resulted in the formation of “land grant” colleges and universities in every state in the union. President Lincoln had a vision of an educated citizenry, and faith in the power of scientific research to increase productivity and improve the lives of all Americans. America’s public land grant institutions have grown to be among the premier research universities in the world; and that distinction directly applies to the University of California.

Cooperative Extension and the Agriculture Experiment Station are rooted in the principles of the original Morrill Act and have consistently demonstrated their resourcefulness in addressing the evolving needs of California. The Agriculture Experiment Station is comprised of faculty, facilities, and programs housed on three UC campuses (Berkeley, Davis and Riverside), and at the School of Veterinary Medicine, also at Davis. Cooperative Extension is a statewide network of academics, programs, and facilities located in every county in California, on three UC campuses (Berkeley, Davis and Riverside), and nine Research and Extension Centers in different ecosystems ranging from the Oregon border to the Imperial Valley. This year we celebrate the 100th anniversary of Cooperative Extension, an organization that continues to impact the everyday lives of all Californians.

Within the University of California, the President has delegated responsibility for leadership of Cooperative Extension and the Agriculture Experiment Station to the Vice President of Agriculture and Natural Resources.

California Agriculture

In 2011, the farm gate value of California agriculture reached a record \$43.5 billion, up from \$38 billion in 2010. California remained the number one state in cash farm receipts, representing 11.6 percent of the U.S. total. The state provides nearly half of fruits, nuts, and vegetables grown in the United States, and produces more than 400 commodities. The state is also a major contributor of dairy products. California agriculture, therefore, plays a vital role in providing an abundant source of safe, nutritious, and remarkably inexpensive food for its residents, the nation, and the world. California agriculture faces unprecedented challenges to its sustainability, including climate change, water, regulation, labor, invasive species, urbanization, and other factors.

The Division of Agriculture and Natural Resources (UC ANR) is a vital partner with California’s farmers and ranchers, providing growers with scientifically tested production techniques, increasing food safety and addressing environmental concerns.

UC ANR at work – almonds

No single crop better illustrates how UC-led innovations contribute to a success story than almonds. California almond growers have increased food safety and nearly doubled yields by adopting practices in irrigation, nutrition delivery, tree spacing, and canopy management stemming from UC Davis and UC Cooperative Extension research. In 2013, California-grown almonds accounted for 100 percent of the US production, and 75 percent of the global production, and surpassed grapes as the second highest grossing farm product in California. (Dairy remains number one.)

Strategic Initiatives

UC ANR has evolved as the needs of California have changed. In 2008, UC ANR completed a strategic planning process looking forward to 2025. Priorities emerged out of that process, and UC ANR defined five strategic initiatives to work across disciplines and focus scarce resources on research in these critical areas:

Endemic and Invasive Pests and Diseases

Pests and disease affect the viability and productivity of agriculture, natural resources, public health, and the environment of Californians. The speed and frequency of international travel today, combined with the volume of imported food, commodities, and materials have greatly increased the rate of establishment of invasive pests and diseases in California. As global climate patterns shift, the distribution of pests and diseases will change, and many habitats will become more susceptible to new threats. The Endemic and Invasive Pests and Diseases Initiative's goals are to foster research and extension programs that 1) exclude pests and diseases through improved detection and diagnostics, 2) develop information that responds to emerging problems with pests and disease, and 3) provide long-term integrated pest management solutions for established pests.

UC ANR at work – the Asian citrus psyllid

In 2006 the Asian citrus psyllid was first identified in California; six years later the huanglongbing disease it transmits was detected. This disease, commonly called "citrus greening," has already destroyed one third of Florida's citrus. The psyllid and the disease present a grave threat to California's \$2 billion citrus industry, the livelihood of citrus farmers and thousands of farmworkers, and the fragile economies in California's rural citrus belt extending from San Diego into the San Joaquin Valley. Their presence prevents exports to countries that do not have this pest and disease. The loss of citrus trees in urban areas will change the face of the landscape and reduce the availability of local fruit. UC ANR is approaching this threat with five strategies: 1) ensuring citrus trees start out disease-free; 2) reducing psyllid populations; 3) detecting infected trees so that they can be removed as quickly as possible; 4) finding a long-term cure; and 5) engaging the public and enlisting their help in fighting the Asian Citrus psyllid and huanglongbing disease.

Healthy Families and Communities

Despite California's \$43 billion agricultural industry and world-renowned private and public universities, its residents face a crisis in the health and education of our young people: high childhood obesity, rising school dropout rates, and low student achievement. UC ANR's Healthy Families and Communities Strategic Initiative addresses major factors contributing to childhood obesity, positive youth development and science literacy through campus- and county-based research and outreach programs. Contributing studies spanned the age spectrum and probed micro areas within genetics and nutrient-disease relationships to macro socio-economic systems. with diverse audiences in geographic locations ranging from small rural to large urban areas within the state and internationally.

UC ANR at work – Nutrition Education

Two UC Cooperative Extension nutrition programs, the Expanded Food and Nutrition Education Program (EFNEP) and the UC CalFresh Nutrition Education Program (also known as SNAP-ED), work with community agencies and schools to deliver nutrition education to low-income families, both adults and youth, to improve health and food security, and to assist in the prevention of childhood obesity. The EFNEP and CalFresh programs are delivered in 33 counties and reach over 222,000 participants.

Sustainable Food Systems

Projected population growth, widespread poverty, and a potential decline in agricultural productivity within the context of climate change, create an urgency to increase food production in ways that are more efficient and sustainable. Part of the solution lies in increasing the productivity of agriculture, but agricultural products must also be made more accessible to consumers, especially those who lack adequate access to healthy and affordable fruits and vegetables. UC ANR scientists have played a key role in increasing both agricultural productivity and access to healthy food. UC ANR is helping to introduce new crops and enterprises, and to develop new uses for existing crops and animals. California agriculture benefits by the value added to its commodities and its competitive advantage in national and international markets. UC ANR also works with producers and communities to increase access to California products through new kinds of distribution models and by creating new markets for small and local producers (including programs such as farm-to-institution and Community Supported Agriculture (CSA)). Agriculture's enhanced economic viability – through increased productivity and enhanced access – improves the quality of life, human health, education, and other services in both rural and urban California and contributes to the growth of the state's overall economy.

UC ANR at work – strawberries

California is the nation's leading strawberry producer. About 65 percent of the strawberries produced in California and about 40 percent of the world's strawberries are from varieties developed by UC and UC ANR scientists. The phase out of methyl bromide, used to control soilborne pathogens and weeds, could result in significant crop losses, causing severe economic distress for growers, price increases for consumers, and reduced competitiveness for growers in international markets. UC ANR researchers are

evaluating alternative chemicals and practices for crop production. Integrated weed management strategies may allow reduced pesticide inputs and ease some of the regulatory concerns surrounding many of the older vegetable herbicides, as well as hold down production costs.

Sustainable Natural Ecosystems

The term “natural ecosystems” refers collectively to the less-intensive land uses characteristic of forests, rangelands, and wetlands. In California, these lands are typically upstream or downstream of intensively managed agricultural and residential lands. They provide valuable goods and services to society, but their ecological diversity and mixed ownership increase the complexity of ensuring their sustainability. A central theme of the Sustainable Natural Ecosystems Strategic Initiative is to better understand the ecological and physical processes that control overall system productivity and thereby better understand how these processes are managed in our highly variable climate. Even the ecosystems in federal parks and wilderness areas have significant interactions via fires, and atmospheric-land deposition and emissions, with the private and public landscapes that are valued for the goods and services that are consumed or managed by California's residents. Population growth, climate change, land use change and fragmentation, and limited science literacy about these ecosystems are adding to the challenges. Areas of inquiry for the Sustainable Natural Ecosystems Strategic Initiative are: Land Use and Habitat Fragmentation, Biodiversity, Water Supply, Energy, Climate Change, and Understanding and Valuing Ecosystem Services.

UC ANR at work – wildfire management and control

Another important issue for natural ecosystems on the residential fringe is addressing the seasonally high level of wildfire risk that can often be the single largest type of resource management expenditure in these areas. Educating homeowners about fire-safe landscaping is one of the most effective ways to connect landowners with their quasi-natural surroundings, increase fire safety, reduce costs associated with property destruction, and reduce the risk of erosion and debris flows after a fire. The UC Cooperative Extension Sustainable and Fire-Safe (SAFE) Landscapes program focuses on helping wildland/urban interface homeowners create and maintain fire-safe landscaping around their homes and neighborhoods. Combined with the statewide efforts to educate homeowners through online tools to ensure that all homes are more resilient to any fire risks, these efforts can significantly reduce the costs and losses that result from the interaction of residences and seasonal wildfires.

Water Quality, Quantity and Security

Water is the life blood of California's economy. As such, water supply and quality for agricultural, urban, and environmental systems are critical issues facing the state over the next 20 years and beyond. Several issues regarding California's water are paramount:

- The supply of water will be limited for all users.
- Competition for water will intensify among agricultural, urban, and environmental users, with water being transferred from agriculture to the latter two groups.
- Short- and long-term climate trends will exacerbate the problems associated with water availability.

- Degradation of water quality will become more important as a major public issue.
- Legal and regulatory decisions will have significant impacts on water use and quality among all sectors.

UC ANR at work – nitrogen management

UC ANR is working to ensure that all Californians have access to safe drinking water and that the state's farmers can grow enough food to help meet the world's increasing demand. Research has shown that nitrogen fertilizer used in agricultural production can over many years move from a plant's root zone into groundwater. UC Cooperative Extension and Agricultural Experiment Station researchers are working with growers on fertilizer management, irrigation efficiency, and other farming practices to provide options for protecting groundwater, which serves as a primary drinking water source for many rural communities.

Statewide Programs

Cooperative Extension Specialists and Advisors, and Agricultural Experiment Station faculty are on the cutting-edge of research that is used to address emerging issues. Science-based information is provided to Californians, in communities large and small, through statewide programs. An even broader audience is reached via the web. Our website, <http://ucanr.edu/>, receives more than 90 million page views each year.

Agricultural Issues Center

The University of California Agricultural Issues Center (AIC) is a forum for the identification and analysis of important issues affecting the agricultural sector. AIC provides broadly based, objective information on a range of critical, emerging agricultural issues and their significance for the economy and natural resources through studies, conferences, and publications. Studies are on topics such as international markets, invasive pests and diseases, the value of agricultural research and development, agricultural policy, and the rural environment among others. The issues are often global, but AIC emphasizes implications for agriculture and natural resources in California. The audience for AIC research and outreach includes decision-makers in agriculture and government, scholars and students, journalists and the general public.

Informatics and Geographic Information System

A new statewide program is being launched this year – Informatics and Geographic Information Systems (IGIS). Over the next five years IGIS will become the nexus for UC ANR's rich and diverse geospatial and ecological data, research information, and resources for academics and the public who rely on geospatial and informatics data, analysis, and display. Through data capture, information sharing, and collaboration, IGIS aims to increase the ability to make meaningful predictions of the agricultural, ecosystem, and community response to future change, to increase understanding of California's diverse natural, agricultural, and human resources, and to support research and outreach projects that enhance agricultural productivity, natural resource conservation, and healthy communities into the future.

Integrated Pest Management

The University of California Statewide Integrated Pest Management Program (IPM) helps residents, growers, land managers, community leaders, and other professional pest managers prevent and solve pest problems with the least unintended impacts on people and their surroundings. The program draws on expertise of University of California scientists to develop and distribute UC's best information on managing pests using safe and effective techniques, and strategies that protect people and the environment. These techniques and strategies are the basis of integrated pest management. IPM works through Cooperative Extension to deliver information to clients in every California county. Web and printed publications provide a wealth of how-to information about identifying and managing pests, and the program also provides online training courses.

Master Gardeners

The University of California Master Gardener Program extends to the public UC research-based information about home horticulture and pest management. In exchange for the training and materials received from the University of California, master gardeners perform volunteer services in a myriad of venues. The Master Gardener Program is dedicated to facilitating excellence in County Master Gardener Programs by increasing the professionalism of coordinators and volunteers. More than 45 California counties have UC Cooperative Extension Master Gardener Programs with 6,000 UC-trained Master Gardener volunteers ready to answer gardening questions. Volunteers contributed 336,000 hours of service last year.

Sustainable Agriculture Research and Education Program

The Sustainable Agriculture Research and Education Program (SAREP) provides leadership and support for scientific research and education in agricultural and food systems that are economically viable, conserve natural resources and biodiversity, and enhance the quality of life in the state's communities. SAREP serves farmers, farmworkers, ranchers, researchers, educators, regulators, policy makers, industry professionals, consumers, and community organizations across the state.

Youth, Families and Communities

The Youth Families and Communities (YFC) statewide program has a focus on youth, nutrition, family, and community programs.

The ***4-H Youth Development*** program is offered in 57 counties, focused on providing experiential learning that develops leadership, citizenship, life skills, and supportive environments in which culturally diverse youth and adults are engaged to reach their fullest potential while advancing the field of youth development. Youth can join 4-H clubs, 4-H camps, 4-H after school programs, and 4-H events. Over 71,500 youth were enrolled in the 2011-2012 program year. UC certified 14,000 adults to work with 4-H youth, and they contributed one million volunteer hours last year.

The ***Expanded Foods and Nutrition Program (EFNEP)*** is a nutrition education program, available in 22 counties, to assist low-income youth and families with young children to acquire knowledge, skills, and attitudes, and to change behavior necessary to choose nutritionally sound diets and improve nutritional welfare.

Academic excellence and the return on investment

In December 2012, the President’s Council of Advisors on Science and Technology released its Report to the President on Agricultural Preparedness and the Agriculture Research Enterprise. It recommended “that the United States increase its investment in agricultural research by a total of \$700 million per year.” Investment in agricultural research is important for the economy, the environment, and the health of our communities. Economists have shown that every \$1 invested in agricultural research and development has provided a benefit of \$21 to California, with another \$11 in spillover benefits to other states.

UC ANR academics are leaders in their fields. In 2011, nine were inducted into the National Academy of Sciences; 12 were Fulbright Fellows; 14 were American Association for the Advancement of Science fellows; and in total they published over 1,700 peer-reviewed publications.

Conclusion

UC ANR is the bridge between local issues and the power of UC research. UC ANR continues to develop and implement new models of service delivery with reduced numbers of employees; it is increasing its fundraising efforts, developing new partnerships with industry, and creating “multi-county partnerships” to reduce administrative overhead and investing the savings in programs. Its public service mission creates innovative new knowledge through research, develops education programs on the campuses and in local communities, and provides rich science-based information to farmers, ranchers, and policy makers. The strength of UC ANR’s research and service mission produces healthy food systems, health communities, healthy environments, and healthy Californians.

Attachments:

[Attachment 1: Investing in California](#)

[Attachment 2: Cultivating California](#)