

A century of science and service

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On a warm Friday, May 8, 1914, in Washington D.C., two pieces of new legislation awaited President Woodrow Wilson's signature: a proclamation establishing the second Sunday each May as Mother's Day, and the Smith-Lever Act. The honoring of mothers dominated the news that day, but Wilson recognized the importance of the Smith-Lever Act, calling it "one of the most significant and far-reaching measures for the education of adults ever adopted by government."

Sponsored by Sen. Hoke K. Smith and Rep. Asbury F. Lever, the bill was the result of national efforts to create a new educational model for U.S. agriculture. At that time, land-grant universities ran farmers institutes and short courses taught by lecturers, and the U.S. Department of Agriculture (USDA) offered its own form of Extension work that focused on pest control field demonstrations in the South and farm

management in the North. Yet there was no consistent or efficient way to deliver important knowledge from the university campuses to the communities that needed it. Passage of Smith-Lever launched a century of innovation in U.S. education that continues to this day. In California, the educational model born out of the legislation is UC Cooperative Extension. For 100 years this statewide network of UC researchers and educators has developed and provided science-based information to solve locally relevant challenges in the areas of economics, agriculture, natural resources, youth development and nutrition.

Progressive roots

Agriculture has always been vital to America. In 1860, at the outset of the Civil War, farmers made up 58% of the U.S. labor force. It was that demographic that created the impetus behind the 1862 Morrill Act, which gave each state a grant of land to establish a college that would teach practical subjects such as agriculture and engineering (see *California Agriculture*, April-June 2012, pg. 42). A key role of those

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California milestones



Library of Congress

1862

President Lincoln signs Morrill Act, authorizing development of agricultural "land-grant" colleges in each state

1887

Hatch Act establishes federal funding for agricultural research in state land-grant colleges

1913

Andrew Hansen Christiansen named California's first Extension farm advisor, placed in Humboldt County

1912

UC agricultural clubs formed in Ferndale and Fortuna; these early clubs evolved into today's 4-H program



1919

B.H. Crocheron recruited to direct state's Agricultural Extension Service, which he does for next 35 years

1918

First UC Extension specialist, a poultryman, hired with goal to double egg production from 80 eggs per hen per year average

1900

1880

1860

1868

University of California founded to teach "agriculture, mining and the mechanical arts"



The Bancroft Library, UC Berkeley

1914

Congress passes the Smith-Lever Act, making federal funds available for extension work

1915

UC Agricultural Extension Service (later renamed "Cooperative Extension") appoints farm advisors in Glenn, Solano, Stanislaus and Placer counties



Library of Congress

1917

Emergency war appropriations provide growth for UC Agricultural Extension as "food for victory" becomes national priority

The presidential roots of Cooperative Extension

Over the course of more than half a century, Presidents Abraham Lincoln and Woodrow Wilson signed bookend legislation that created the land-grant institutions and Cooperative Extension. Despite very different backgrounds and political ideologies, they reached very similar conclusions about the vital nature of agricultural education to U.S. prosperity.

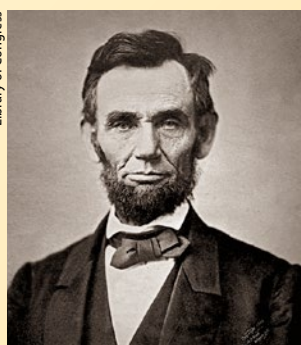
President Lincoln, a Republican, who signed into law the Morrill Act, creating the nation's system of public higher education and land-grant institutions, and President Wilson, who signed the Smith-Lever Act, which created the Cooperative Extension service, were

both shaped by the American Civil War. Lincoln experienced the war firsthand, serving as president of the United States when the South seceded from the Union, and brought the nation intact, although battered, through 4 grueling years of war. Lincoln was born and raised on a farm, and his lack of formal education influenced his ideas about educational access for Americans. Life on the farm also influenced his ideas about the importance of

creating a federal-level agency (the USDA, what Lincoln termed "the people's department") to manage agriculture, of opening up land to settlers by means of the Homestead Act, and of creating a transnational railroad system to promote commerce.

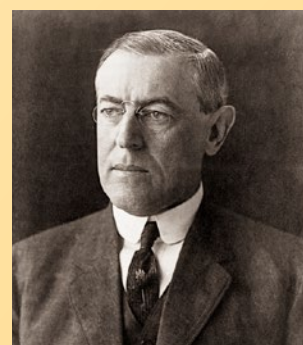
A Democrat, Wilson was born in Virginia. At the end of the Civil War, when he was only 8 years old, he watched the former Confederate president, Jefferson Davis, brought through his community in chains. As a youth he saw how local farmers struggled after the war. He attended elite educational institutions, including the University of Virginia and the College of New Jersey (later renamed Princeton University), and received a doctorate from Johns Hopkins University. Wilson was the first president to ride to his inauguration in an automobile. He never forgot his firsthand observations of the economic challenges Southern farmers faced in the post-Civil War era; these experiences strongly influenced his ideas about scientific agriculture and the importance of Extension education.

Library of Congress



President Abraham Lincoln

Library of Congress



President Woodrow Wilson



1920

Crocheron establishes week-long traveling conferences where caravans of farm advisors and Farm Bureau representatives travel for hundreds of miles viewing selected farms.

Farm Bureau centers established in more than 500 rural communities



1922

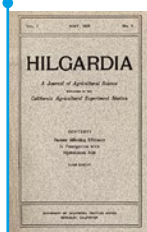
Growers begin acquiring tractors; UC Extension holds one-week schools in 12 counties teaching growers how to adjust and repair their new machinery

1924

Extension workers help bring an outbreak of foot and mouth disease under control

1925

Hilgardia, a monographic series of agricultural science, begins



1929

Extension provides emergency assistance when St. Francis Dam break inundates portions of Ventura and Los Angeles counties

Extension Director Crocheron embarks on fact-finding tour in Asia to investigate potential markets for California specialty crops; his outlook is not optimistic

1927

Extension academics begin specializing in poultry, dairy, citrus, walnuts, agricultural engineering, etc.

1920

1921

Volunteer leader concept implemented for high school boys' and girls' agricultural clubs organized by farm advisors, forming the basic structure and philosophy for today's 4-H Youth Development Program

1923

Extension completes first decade with 40 farm advisors, 33 assistant farm advisors and 21 home demonstration agents in county offices

1926

First Agricultural Extension circulars published



1928

"4-H" appears for the first time in California reports on youth work

UC Cooperative Extension history

colleges was to develop knowledge that would help farmers produce enough food and fiber to meet the needs of a growing nation.

In 1887, the Hatch Act was passed to further this mission; it provided land-grant colleges with funds to develop agricultural experiment stations, where research was conducted. Passage of the Adams Act in 1906 doubled funding to the research stations, while requiring a new funding commitment from state sources. The infusion of federal and state capital facilitated agricultural research, education and innovation, and generated increasing interest in U.S. agriculture among policymakers concerned about food security and increasing economic opportunities.

Five years of debate had preceded the Smith-Lever legislation. The McLaughlin Bill, proposed in 1909, left no clear role in Extension work for the USDA. Opponents of that bill were familiar with the work of early Extension educator Seaman A. Knapp and argued for his model, which emphasized demonstration work on farms. The final Smith-Lever legislation was a compromise, facilitated by USDA Secretary David Houston, that proposed a single Extension service from the USDA's agricultural

Extension system and land-grant education, and created a federal, state and county funding formula for it that persists to this day.

The intent of the Smith-Lever Act, like earlier agricultural legislation, was broadly democratizing. Initially, Extension focused on improving and reforming rural life, partly in response to the findings of the Country Life Commission, created by President Theodore Roosevelt in 1908. The Smith-Lever Act was rooted in the Progressive philosophy of helping people help themselves, a philosophy that continues to inform Cooperative Extension's work today, and it demonstrated Progressive Era beliefs in the value of public-private partnerships and shared funding models.

In the case of Cooperative Extension, the model included federal (USDA), state (land-grant universities) and local support (county funding, and the organization of a local Farm Bureau to sponsor the work). This relationship with the Farm Bureau was a vital component in Cooperative Extension's formation and identity; their growth and partnership has been

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1930

Focus turns to practical application of science to agriculture, with progress on soil fertility and new dusts and sprays to control crop diseases

1934

Severe drought hits California: 18 California counties declared emergency areas eligible for federal funds; farm advisors serve as government agents in purchasing livestock in the hardest-hit areas

1934

Extension tapped to help federal government implement and administer Agricultural Adjustment Administration programs to help growers stabilize their incomes

1938

Federal-state agreements establish pilot land-use planning program in U.S. counties; UC Extension monitors programs in Riverside, Kern, Sonoma and Yuba counties

1937

George B. Alcorn joins Extension as agricultural economist; he will become third director of California Agricultural Extension Service in 1956



1943

Extension asked to administer Emergency Farm Labor Project to assure adequate supply of workers for wartime agricultural production

1942

In response to Pearl Harbor, Extension agents organize Emergency Farm Fire Protection Project, forming more than 2,000 volunteer fire companies in 42 counties to thwart possible incendiary attacks

Director Crocheron organizes California Minute Men rural militia; 20,000 men sign up through county Extension offices to serve on reserve duty

1940

1940

Farm advisors and home demonstration agents lead wartime committees, conduct war bond campaigns and organize state militia that recruits more than 23,000 volunteers

1941

Victory gardens and rural fire protection become important Extension topics



Library of Congress

1930

1932
"Cal-Approved" seed program begins to ensure quality seed for standard and improved varieties

1935
With encouragement from a UC Extension forestry specialist, 2,000 miles of windbreak planted to effectively protect Southern California citrus districts



Anaheim Public Library

1936

Congress approves Soil Conservation and Domestic Allotment Act to conserve soil and prevent erosion; Extension agents given responsibility of carrying out organizing work

A profile in excellence

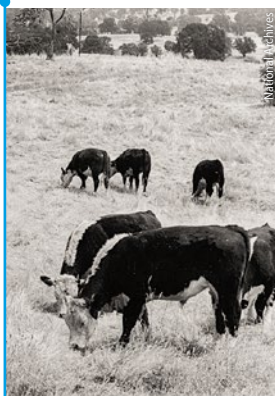
In the late 1930s and early 1940s, a young UC-trained agronomist named Milton D. Miller worked as an assistant farm advisor in the UC Cooperative Extension office in Ventura County. When the United States entered World War II, Miller enlisted in the U.S. Army as a captain and was deployed to the Pacific theatre. He worked for the U.S. Subsistence Procurement Branch in Australia, where he helped farmers transition from hand-hoeing vegetable fields to using mechanical weeders, as part of the effort to boost Allied war-time food production. An engaging writer, Miller corresponded regularly with the Cooperative Extension staff in Ventura, exchanging news and thanking them for gift packages that included fruitcake, handkerchiefs and tobacco.

After the war ended, Miller returned to service with UC Cooperative Extension, working as an Extension specialist from what eventually became the UC Davis campus. His notable career spanned more than 50 years, and his work in rice, cereal and oilseed crops, and food procurement had local, state, national and international impacts. Producers here and all over the world benefited from his research on rapidly developing technologies to improve practices and increase production.



Milton Miller (right) in a Tasmanian carrot seed production field during World War II, 1944.

Special Collections, General Library, UC Davis



1945

In response to newly formed Forest Service grazing restrictions, Extension advisors help ranchers determine most efficient locations and methods to feed cattle

1948

Extension Director Crocheron dies suddenly, ending an era; acting director Chester Rubel writes "... a deep understanding of rural problems, a genius for organization, and a devotion to agriculture and to rural people ... made [Crocheron] an outstanding leader. ... The foundations which he laid are sound and enduring ... His work will go on."



1956

UC Davis scientists and Extension farm advisors develop tomato varieties around state, identifying three new hybrids with superior yields

1950

Extension reorganizes to better cope with scientific and technical advances and with California's rapidly increasing population; home demonstration agents become home advisors; county director positions created to coordinate local farm and home advisor programs

New specialist positions added in range management, ornamental horticulture, subtropical horticulture, plant pathology, vegetable crops, deciduous fruits and nuts, agricultural engineering, marketing, extension education, 4-H, home economics, youth counseling, apiculture, biometrics, climatology, crops processing, forest products, nematology, parasitology, enology, pesticide safety, consumer marketing, wildlife management, public affairs, radio-TV, dairy products and soil and water salinity



1957

Extension farm advisors work on improving irrigation efficiency by applying water based on specific soils and crop needs

1955

Extension staff totals 549, more than double 1940's Extension workers

1950

1947

Seventy-eight new Extension agents hired

1953

Extension researchers study air pollution damage to various crops in Los Angeles Basin and San Francisco Bay Area

1954

UC Extension specialists coordinate with USDA to develop new shade structures for livestock in hot weather



1958

UC Extension entomologists release guidelines for growers on minimizing effects of pesticides on bees

1959

Extension agricultural economists study challenges and opportunities in California's rural-urban transition

1946

Sixty new Extension appointments made
California Agriculture journal begins publishing



UC Cooperative Extension history

Passage of Smith-Lever launched a century of innovation in U.S. education. In California, the educational model born out of the legislation is UC Cooperative Extension.

extraordinarily successful in advancing American agriculture. Local farmers and Cooperative Extension shared ownership in this shared model and the knowledge produced, and they still do.

What is difficult to comprehend today, 100 years later, is the sense of urgency surrounding the need

to improve U.S. agriculture in 1914. The nation's agricultural sector faced difficulties in a number of areas, including production, yield, labor sources and distribution. Rural areas were depopulating, and the number of farmers was dropping. At the same time, an inexpensive, secure and ordered food supply was believed essential for civil order and national progress.

1914 was a momentous year. The Panama Canal opened. Ford Motor Company established an 8-hour workday and increased wages. The National Guard fired upon striking miners in Colorado. Racial tensions ran high, as did tensions between rural and urban

populations. U.S. naval forces landed and occupied Veracruz, Mexico, bringing the two countries to the brink of war. By August, World War I had started, and U.S. agricultural products were sorely needed to feed and support our allies. Efficient agriculture backed by scientific solutions became a national priority.

Partners in California

Even before passage of the Smith-Lever Act in 1914, efforts were already under way to create an agricultural Extension system in California, building on the success of the state's land-grant college, the University of California. The first UC campus, at Berkeley, had agriculture as an important early focus. In 1907, a university research farm was opened in Davisville to serve Berkeley students. That site grew into a new campus, UC Davis. The same year, UC established the Citrus Experiment Station in Riverside, which was instrumental in helping California emerge as the nation's premier citrus producer, creating a second Gold Rush of sorts, as thousands flocked to the Golden State to capitalize on the opportunities that the state's agricultural and natural resource abundance

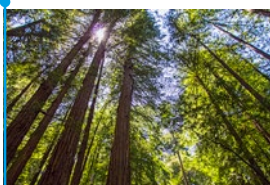
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1960

Extension efforts on advancing production agriculture improve farm productivity and mechanization

Home economics program reorganized as Family and Consumer Sciences

4-H programs developed in urban, low-income areas



1962

Experiment Station researchers and specialists study how to protect state's redwood trees from soil compaction and other damage from recreation, logging and development

1964

50th anniversary of Smith-Lever Act; UC Extension has 532 farm and home advisors and specialists in 50 subject areas



1965

Extension irrigation specialist and Sacramento County farm advisor encourage nurseries to use plastic tubes with electric timer to irrigate containers, rather than overhead sprinklers

1967

Extension farm advisors work with UCD's Department of Vegetable Crops to develop new varieties of peppers resistant to tobacco mosaic virus



1970

Extension programs begin to take an international perspective, reflecting concerns about world food supply

Programs established in community development, farm personnel management, integrated pest management (IPM) and marine fisheries

1971

Extension farm advisors, specialists and Agriculture Experiment Station faculty boost Central Coast production by conducting mechanical harvesting trials for Ventura County citrus, demonstrating chemical inhibition of avocado top regrowth and assessing lettuce response to soil fumigation for nematode control

1960



1961

UC's pioneering biocontrol efforts well under way; scientists release imported parasitic wasps to combat specific citrus pests

1963

Farm advisors work with rice growers in Butte, Colusa, Glenn, San Joaquin, Sacramento, Sutter, Yolo and Yuba counties on fertilizer efficiency

1966

Extension entomologists and Fresno County farm advisors study impact of insecticides on beneficial insects in cotton fields, part of UC's work on pest control methods that utilize beneficial insects, mites and spiders



1970

1969

Expanded Food and Nutrition Education Program (EFNEP) developed to reach low-income families

1972

UC conducts drip irrigation experiments on San Diego County avocados

1973

In response to environmental concerns, UC works with Santa Clara County's canning industry on using cannery wastes as soil amendment

May 8, 2014: Day of citizen science

The real strength of UC Cooperative Extension is its ability to facilitate and build networks of knowledge that include scientists, producers, community members and practitioners. We learn together. This engaging process by everyone, not just the professional experts, has been an important part of our national history. Before the formalization of higher education and the specialization of scientific disciplines, much of our scientific knowledge was gathered by citizens through trial and error and then passed along to others. Presidents George Washington and Thomas Jefferson shared their knowledge of agricultural science in their correspondence and at agricultural fairs and meetings. Benjamin Franklin published scientific discoveries that provided a foundation for future technological innovation. John Bartram, a self-trained botanist and explorer, presented his plant knowledge in Philadelphia by making a garden, considered by many to be the nation's first significant botanical collection.

Citizen science is gaining traction in contemporary communities. Also known as crowd science, crowd-sourced science, networked science or public participation in science research, citizen science is a form of participatory scientific research conducted, in whole or in part, by amateur or nonprofessional scientists. Through citizen science projects, community members engage and participate in

scientific research by contributing their own knowledge, observations and intellectual efforts, often using social, web-based technologies or mobile applications.

On Thursday, May 8, 2014, the Division of Agriculture and Natural Resources (UC ANR) will celebrate the 100th birthday of UC Cooperative Extension with a citizen science event – the Day of Science and Service. UC Cooperative Extension will crowd-source data for citizen science projects about water, food and pollinators. Every Californian is invited to participate in this free celebration of science.

UC ANR is developing data collection maps, and participants will be able to access them through their computers or smartphones and add their data directly to the maps. After adding data, they will be

taken to a landing page with more information about why the questions are important and links to additional research in these three areas. After the Day of Science and Service, the data will be tabulated and analyzed, and the results will be shared with participants.

For more information about participating, visit <http://Beascientist.ucanr.edu>.

—Marissa Palin Stein



1976

UC research indicates that EFNEP improves dietary practices of low-income populations

1977

UC Small Farm Program established to focus on specialized needs of small-scale and limited-resource growers

1980

From 600 pages of oral history gathered by UC researchers, UCCE studies how technology has changed farms and farm families



1980

UC announces the release of six new strawberry varieties

1982

Peripheral Canal referendum fails; UCCE praised for providing objective water policy information to public

1986

UC begins two environmentally oriented programs: Sustainable Agriculture Research and Education Program, to help California growers practice sustainable production and marketing systems; and Integrated Hardwood Range Management Program, to study problems facing oak trees and other hardwoods

1980

1974

UC changes name of Agriculture Extension Service to UC Cooperative Extension (UCCE) to reflect its broadening social and economic purview



UC explores impacts of significant air pollution on Southern California leafy vegetables and on San Joaquin Valley cotton production

1979

UC Statewide Integrated Pest Management Program formed to accelerate research and education on production alternatives that use fewer chemicals

1981

UC survey of agricultural college graduates shows women have not yet broken barriers in employment, salaries and status in agriculture
UC hires its first affirmative action officer to encourage more women and minorities to seek careers in CE



UC Cooperative Extension history

seemed to ensure. The experiment station at Riverside served as the foundation for the UC Riverside campus.

By the time the Smith-Lever Act became law, new knowledge and technologies developed by UC scientists were critical to the growth of farming and allied industries around the state. UC agriculture faculty were already offering short courses at farmers institutes, but farmers were clamoring for more and eager to have a Cooperative Extension educator, known as a farm advisor, assigned to their community.

Anticipating passage of Smith-Lever, UC officials required each county government that wanted to participate in a Cooperative Extension partnership to allocate funding to help support Extension work in that community. Additionally, it was required that a group of farmers in participating counties organize into a Farm Bureau to help guide the Cooperative Extension farm advisor on the issues of local agriculture. (These grassroots groups later evolved into the California Farm Bureau Federation.) The first California county to sign up, Humboldt County, had its farm advisor in place by July 1913, before passage of the federal legislation. Seven more counties came on board in 1914, and in the following years 41 of the 58 California counties secured Cooperative Extension farm advisors.

Cooperative Extension played a critical role on California's home front during World War I, helping farmers to grow enough wheat and other crops to meet expanded wartime needs. Extension's value was quickly established as farmers came to rely on having an expert close at hand who was familiar with local conditions and crops. In addition to addressing the needs of farmers, Cooperative Extension soon expanded to provide educational opportunities for their families. Female extension agents — home advisors — were hired; they taught food preservation and nutrition and ran other programs for rural women and activities for local youth. This new generation of college-educated female home economists increased the contact and interchange between urban and rural communities, especially on social and domestic issues. Cooperative Extension also reached thousands of young people who would learn about food production, animal husbandry, cooking, science and more through participation in 4-H clubs.

UC Cooperative Extension today

UC Cooperative Extension, part of UC Division of Agriculture and Natural Resources (UC ANR), is comprised today of 320 locally based Cooperative Extension advisors, 650 campus-based Cooperative Extension specialists, 60 county offices throughout the state, and nine research and extension centers. It has

1988

UCCE reorganized, making campus-based specialists integral part of academic departments



1989

California 4-H club members number about 76,000; more than 40% live in large cities or suburbs and 55% are girls

1992

Experts from UCCE analyze economic impact of sweet potato whitefly in Imperial Valley

1990

1990

Money Talks program developed by UCCE home economists to help low-income families improve their financial situations

1991

UCCE specialists share potential impacts of fair trade agreements on popular commodities

1994

Study by UCCE scientists documents trend of growers using more sustainable farming practices



1993

UCCE helps small-scale growers by providing workshops for Southeast Asian immigrant growers in Central Valley

1996

UCCE begins using World Wide Web and email to conduct outreach

Spanish-language UCCE specialist begins using radio to teach nutrition to Latino families



2001

UC scientists develop integrated approach to managing sudden oak death, a disease that has killed millions of oak trees

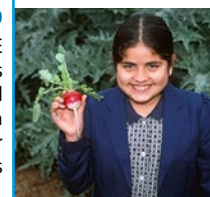
1999

UCCE team documents significant benefits from agritourism to growers and communities in San Diego and other metropolitan counties

2000

2000

Study by UCCE researchers finds that school gardens teach children healthier eating habits



1998

In response to dust pollution concerns, UCCE scientists collaborate to stabilize soil and reduce windblown dust in Antelope Valley



1995

With help from UCCE researchers, almond growers in Merced County reduce pesticide use

rural roots, but as the nation has grown and communities have changed, Cooperative Extension has evolved, adapting programs and developing new ones to meet the needs of rural and nonrural audiences. Since the 1960s, the Expanded Food and Nutrition Education Program (EFNEP) has provided free nutrition education classes in urban communities. Thousands of urban and suburban residents have benefited from the Master Gardener program, which offers workshops and advice to home, community and school gardeners; currently, more than 5,400 master gardener volunteers serve California communities. The Master Food Preserver program teaches Californians to safely preserve the healthy foods we produce. A new Master Naturalist program is training volunteers to help communities respond to complex issues in sustainable natural ecosystems; observations by volunteers in the community are recorded using mobile technologies so the data can be studied by scientists, who then respond to and help solve community problems.

All of Cooperative Extension's activities are grounded in university research and developed in partnership with local communities. After a century of service, UC Cooperative Extension continues to deliver practical, trusted, science-based solutions to Californians.

Suggested reading

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2005

Kearney Agricultural Research and Extension Center celebrates 40 years partnering with UCCE on research

2007

UCCE develops and tests IPM program for cut roses, the largest component of California's cut-flower industry



2013

UC ANR holds Global Food Systems Forum, attracting viewers from more than 70 countries

2014

UCCE celebrates 100 years of bringing science and service to California communities

2003

To help California cheesemakers develop successful marketing strategies, UCCE studies shopping habits of specialty cheese consumers

2010

Four UC ANR strategic initiatives established: Sustainable Food Systems, Healthy Families and Communities, Endemic and Invasive Pests and Diseases and Sustainable Natural Ecosystems

UCCE study finds Southern California nurseries adopting best practices for reducing water runoff from their facilities

2011

Strategic initiative for Water Quality, Quantity and Security established

Collaborative UCCE and UCD study on nitrate levels in groundwater released to State Water Board and governor

2010

2004

UCCE nutritional research finds link between food insecurity and obesity in Latino families



2006

UCCE study finds decreasing size of grape harvest baskets leads to healthier farm workers and fewer back problems

2008

Sonoma and Napa UCCE study biocontrol in vineyards as part of CE's work on making viticulture more sustainable

2009

UC ANR introduces its Strategic Vision through 2025

2012

UC ANR internal grants program funds research and extension education in new areas of biofuels and local food systems

—Rose Hayden-Smith, Rachel Surls and Marissa Palin Stein