

CA&ES

# Outlook

COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES • UC DAVIS • SPRING/SUMMER 2008

We propose a  
**TOAST**  
to **100 WAYS**  
our college has shaped the world



# CA&ES Outlook

is a publication of the  
College of Agricultural and  
Environmental Sciences

## EXECUTIVE EDITOR

Ann Filmer

## MANAGING EDITOR

John Stumbos

## ASSOCIATE EDITOR

Robin DeRieux

## GRAPHIC DESIGNER

Eric Rohr

## CONTRIBUTING WRITERS

Melissa Haworth  
Christine Schmidt  
Dawn Spinella  
Neal Van Alfen

## EDITORIAL ASSISTANTS

Michelle Immel  
Elisabeth Kauffman

## CA&ES OUTLOOK ONLINE

<http://outlook.ucdavis.edu>

## UC DAVIS

COLLEGE OF AGRICULTURAL  
AND ENVIRONMENTAL SCIENCES  
*Office of the Dean*

## DEAN'S OFFICE

University of California  
One Shields Avenue  
Davis, CA 95616-8571  
Phone (530) 754-6788  
Fax (530) 752-9049  
[outlook@agdean.ucdavis.edu](mailto:outlook@agdean.ucdavis.edu)

[www.caes.ucdavis.edu](http://www.caes.ucdavis.edu)

This publication is funded  
partially through gifts from  
the J.G. Boswell Foundation.

PRINTED ON RECYCLED PAPER

The University of California  
does not discriminate in any  
of its policies, procedures,  
or practices. The university is  
an affirmative action/equal  
opportunity employer.

# 100 ways our college has shaped the world

INTRODUCTION	4
CROP PRODUCTION	5
INSECTS AND PESTS	8
AGRICULTURAL INNOVATION	10
ANIMAL SCIENCE	11
FOOD AND HEALTH	12
GRAPES AND WINE	14
GLOBAL INVOLVEMENT	16
WATER RESOURCES	17
THE ENVIRONMENT	18
THE NATURAL WORLD	20
THE STUDENT CONNECTION	21
SOCIAL CHANGE	22

## ALSO INSIDE:

ALUMNI NOTES / EVENTS	25
MAKING A DIFFERENCE	26
CA&ES DEAN'S CIRCLE	28

## SHARE YOUR STORY

To celebrate the UC Davis Centennial, the university is inviting its alumni, faculty, staff, students, and friends to share their centennial stories online.

You can share a memory, an event, or a digital photo from long ago or the recent past at this website:

<http://centennial.ucdavis.edu/>

**COVER PHOTO:** Professor Maynard Amerine, a faculty member from 1935 until retirement in 1974, was an internationally known expert on the technical aspects of grape growing and winemaking. He and colleagues helped revive the California wine industry after Prohibition and set the stage for its emergence as a world-class center of quality wine production.

## MARK YOUR CALENDAR

## UC DAVIS FEATURED AT THE STATE FAIR

**THE CALIFORNIA STATE FAIR** is Aug. 15 to Sept. 1, 2008, at the Cal Expo Fairgrounds in Sacramento. An entire building at the fair is devoted to the UC Davis centennial, with interactive displays and exhibits. Learn more at [www.bigfun.org](http://www.bigfun.org).

## WITH AGE COMES WISDOM

Through the years, our college has helped UC Davis shine.

ONE HUNDRED YEARS AGO, THE UNIVERSITY of California established a model farm for research and practical agricultural instruction in “Davisville” to expand the capabilities of the Berkeley campus. Instruction began in a creamery and a livestock pavilion to help Californians improve productivity on their farms and ranches. The University Farm quickly established its own identity — Davis — and eventually its independence from Berkeley.

In honor of the UC Davis centennial, we decided to spotlight 100 of the thousands of ways our people and programs have helped shape our world. We asked department faculty for their suggestions on what to showcase and sought input from emeriti and friends. We pored through department histories and Ann Foley Scheuring’s history of UC Davis, “Abundant Harvest.”

The evolution of UC Davis is testament to the vision, drive, and dedication of generations of faculty, students, staff, and supporters.

We culled photos from Special Collections in Shields Library, ANR Communication Services, the Ansel Adams archive at UC Riverside, and other campus sources. What we present here is a sampling of how the College of Agricultural and Environmental Sciences has had a major impact on California, the nation, and the world.

Agricultural practices and technologies emerging from UC Davis research have fundamentally changed the way we grow, harvest, store, and consume our food. Enduring partnerships between hard-working agriculturalists, public agencies, and university scientists have boosted the state’s bounty and fortified our economy. Today, California produces more than 400 commodities valued at nearly \$32 billion annually in direct farm sales.

COURTESY OF PAW KAZMIERCZAK



CA&ES Dean Neal Van Alfen during his time as a UC Davis graduate student in plant pathology in 1971.

The college has become a leader in research to better understand and protect the environment. Our scientists have created new techniques for studying the natural world, rallied support for needed safeguards, and developed scientifically based methods of resource stewardship. This work has helped preserve natural treasures like Lake Tahoe, improve management of coastal resources, restore native fish populations, and much more.

We have just as importantly helped people adapt to the profound social changes and growth of the last century through innovative programs and partnerships in the human sciences. This has all been done in a spirit of openness and public engagement that’s been a UC Davis hallmark since the first Picnic Day.

The evolution of UC Davis from a modest farm school into one of the world’s premiere research universities is testament to the vision, drive, and dedication of generations of faculty, students, staff, and supporters. We in the College of Agricultural and Environmental Sciences are especially proud of this accomplishment and find satisfaction in knowing our contributions have and will continue to enhance the quality of life for all.

The next issue of our magazine will show you how we’re preparing to take on the issues confronting us today, and those that await us.

NEAL K. VAN ALFEN, DEAN  
COLLEGE OF AGRICULTURAL AND  
ENVIRONMENTAL SCIENCES



# 100

## ways our college has shaped the world

By John Stumbos, Robin DeRieux and Ann Filmer



The idea that became UC Davis was born a century ago out of a compelling need to improve agriculture. In the decades that followed, the fledgling campus thrived and created a culture that valued scientific inquiry and compassion for the world. In this environment, new ideas emerged that have helped people grow the economy, meet threats to the natural world, and adapt to social change. In recognition of our centennial, we reflect on 100 of the countless ways our people, research, and programs in the College of Agricultural and Environmental Sciences have improved the quality of our lives. We honor the contributions of all those who have helped us grow from the “University Farm” of a bygone era into one of the world’s premier research universities.

Davis professors once served as wine judges for the California State Fair. Pictured in a 1939 photo are (standing, left to right) Louis Wetmore, a wine industry official, and UC faculty members Maynard Joslyn, William Cruess, and Maynard Amerine. Seated are professors George Marsh (left) and Albert Winkler.





KARIN HIGGINS/UC DAVIS

## BERRY, BERRY SUCCESSFUL

In the 1950s, pomology specialist Victor Voth and pomology professor Royce Bringham joined an industry-supported effort to improve California strawberries. Selective breeding resulted in new varieties that were larger, more colorful and flavorful, and productive most of the year. Strawberry yields jumped from six to 25 tons per acre. Varietal improvements and cultivation advances have continued through the work of pomology professor Doug Shaw and extension specialist Kirk Larson, who have created tastier strawberry varieties with better disease and pest resistance and improved shelf life, which are also suited to a wider range of growing conditions. Yields now top 30 tons per acre. Strawberries, consistently among the top 10 crops in the state, are the biggest single source of patent revenue for UC Davis. The strawberry production system of raised beds, plastic mulch, and drip irrigation developed by UC Davis is used throughout the world.



## A CORNUCOPIA OF CROPS

UC Davis scientists have developed dozens of new varieties of fruits, nuts, vegetables, melons, forages, grains, and field crops. Traditional plant breeding methods improved taste, color, texture, nutritional quality, disease resistance, and yield capacity. New techniques in molecular biology are accelerating improvements in this hallmark area of research.

# Crop Production

## THE STANDARD FOR CROP PURITY

In 1934, the Agronomy Division at Davis organized the California Approved Seed Plan to ensure a steady supply of pure seed of standard and improved field crops such as wheat, barley, oats, and beans. “Calapproved” seeds eventually became known as certified seed, the standard of crop purity and a model for U.S. and world programs. The certified seed program is known today as the California Crop Improvement Association, a non-profit corporation and the state’s official seed-certifying agency.

## ALFALFA PUTS THE MOO IN MILK

The mainstay of the California dairy industry, alfalfa is the highest-acreage crop in the state today. Campus researchers played an important role in rescuing the crop — a feed for dairy cows — from devastating insects and diseases. In the late 1970s, they cooperated in the release of a new variety called CUF101 that had worldwide impact on improving yield and pest resistance.



DEBBIE VON BLANKENSHIP/UC DAVIS

## THE WILD TOMATO

Plant geneticist and botanist Charles Rick (above) traveled the world for the tomato. Rick joined the vegetable crops faculty at UC Davis after 1940. In the decades that followed, he gathered more than 2,600 wild tomato specimens from the Andes, the Galapagos, and elsewhere in the world. Many of the species collected are now extinct in their native habitats. With this collection, Rick made landmark contributions in plant genetics, evolution, and genome mapping. He also founded the Tomato Genetics Resource Center on campus, the largest known collection of tomato seeds in the world, which is still used today to improve tomato production.

### A CHRONOLOGY OF CA&ES

Many interesting and pivotal events have affected the course of the college over the years.

1862: Congress passes the Morrill Land Grant Act to establish colleges of agriculture.

1868: The University of California is chartered as a land-grant university.





JACK KELLY CLARK/UC ANR

## FRESH FLOWERS FOR AMERICA

Roses, carnations, and chrysanthemums — for half a century, California was the primary producer of these staple flowers in the florist trade. But air transit of flowers from South America caused an upheaval in the state's cut-flower industry 20 years ago. UC Davis researchers worked closely with growers to save the industry by developing new crops like gerberas and potted plants, energy-efficient greenhouses, and postharvest handling systems that helped stabilize the industry. The state's floriculture industry was worth \$1 billion in 2007.

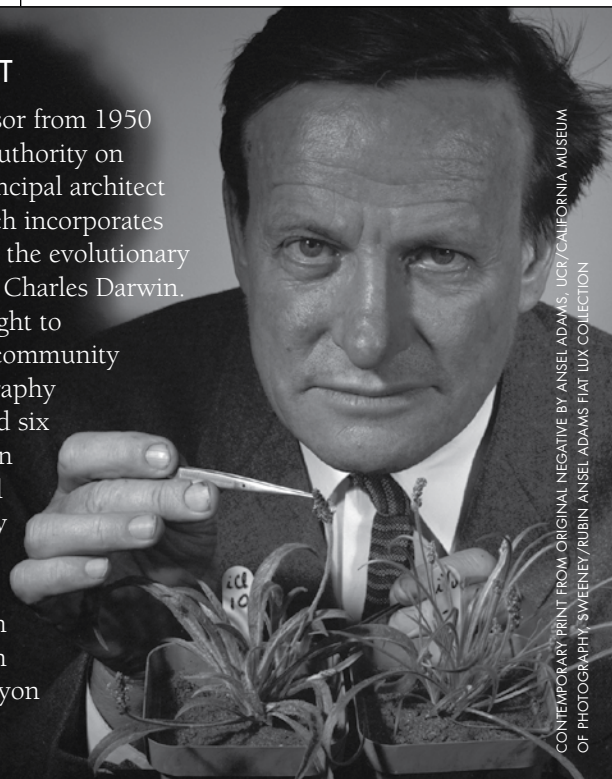
## WALNUT INDUSTRY

Nearly all commercially grown California walnut varieties were developed at UC Davis. In 1948, Eugene Serr and Harold Forde created the walnut breeding program. Twenty years later they released 10 new varieties and three more in 1978, including the widely planted Chandler and Howard. Since then, five new varieties and two new rootstocks with better disease resistance have been released through the Walnut Improvement Program, directed by Professor Gale McGranahan. In 2006, roughly 4,000 family farms produced 346,000 tons of walnuts valued at \$553.6 million.



## LEGACY OF A GIFTED GENETICIST

G. Ledyard Stebbins, a UC Davis professor from 1950 through 1973, was the world's leading authority on plant evolution in his day. He was a principal architect of the field of evolutionary biology, which incorporates knowledge of fossils, genetics, cells, and the evolutionary history of organisms into the theories of Charles Darwin. Stebbins was a prolific lecturer who sought to communicate his ideas to the scientific community and the public. His professional bibliography includes more than 250 publications and six books, including the landmark "Variation and Evolution in Plants" (1950). A vocal advocate for gene banks and biodiversity preservation, Stebbins in 1979 became the first UC Davis faculty member to receive the National Medal of Science. In 1980, the UC Regents honored him with the dedication of the Stebbins Cold Canyon Reserve, located near Lake Berryessa.



CONTEMPORARY PRINT FROM ORIGINAL NEGATIVE BY ANSEL ADAMS, JCR/CALIFORNIA MUSEUM OF PHOTOGRAPHY, SWEENEY/RUBIN/ANSEL ADAMS FIAT LUX COLLECTION

## NURSERY IMPROVEMENTS

California's nursery industry is one of the state's top agricultural commodities. UC Davis scientists have supported its competitiveness through research advances in irrigation management, saving water, and reducing pesticide and fertilizer runoff. Entomologists have developed new biological control methods for whiteflies, thrips, aphids, and other pests. Agricultural engineers developed tools for moving heavy containers and ergonomically designed plant cutters. Horticultural research also examines greenhouse automation, sensor technology, and light and temperature management.

## SAFFLOWER POWER

Safflower became an economically important oilseed crop after 1949 largely through the efforts of UC Davis faculty. Agronomy professor Paul Knowles traveled extensively to gather wild and domesticated safflower species. He also developed varieties high in heart-healthy fatty acids like those in olive oil. Plant pathology professor John Duniway's research on the effects of soil moisture on phytophthora root rot changed safflower breeding and cultivar selection methods.

**1887:** The Hatch Act becomes law, providing federal funds for state agricultural experiment stations.

**1905:** The University Farm Bill provides California state funding for a special campus for agricultural work.

**1906:** The State Farm Commission chooses Davisville as the site for the University Farm.





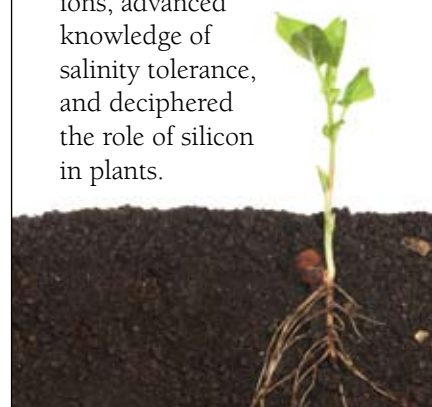
LYRA HALPRIN/UC ANR

## SUSTAINABILITY RESEARCH IN AGRICULTURE

Since the 1980s, the term “sustainability” has been increasingly associated with agriculture. The need for research into alternative agricultural practices led to UC Davis’ Sustainable Agriculture Research and Education Program (SAREP) in 1987 and the Long-Term Research on Agricultural Systems (LTRAS) project in 1990. SAREP, a statewide program of the university’s Agriculture and Natural Resources division, has funded research into innovative methods of cover cropping, minimum tillage, and crop rotations. It has also supported research and programs to address issues such as biodiversity and greater consumer access to locally grown food. “The world’s youngest 100-year experiment,” LTRAS examines different cropping systems grown with a mix of conventional and organic farming methods. With these projects, researchers are working hard to ensure the long-term viability of California agriculture.

## DECIPHERING PLANT NUTRITION

Davis soil scientists have made key plant nutrition discoveries that have improved agricultural productivity worldwide. Perry Stout and Daniel Arnon in 1938 discovered the essential role of molybdenum in plant growth. Stout also led a team finding chlorine an essential element. Michael Reisenauer and Constant Delwiche uncovered the role of cobalt in the nitrogen-fixing bacteria of legumes. In 1970, Delwiche published the first complete global nitrogen cycle. Emanuel Epstein showed how plants accumulate ions, advanced knowledge of salinity tolerance, and deciphered the role of silicon in plants.



## FRUIT TREE PRUNING AN EARLY ACCOMPLISHMENT

The first fruit trees planted at the University Farm in 1908 were the basis of a recommended horticultural shift from vigorously cutting or “heading back” shoots to a lighter, “long prune” method that produced significantly higher yields. This led to an ambitious program of pruning demonstration plots that brought growers from all over the state to Davis. In the winter of 1919–1920, pomologists took the show on the road and conducted 153 pruning demonstrations for 10,691 attendees in counties throughout California.

## YIELDING SUCCESS IN CALIFORNIA RICE

In 1920, horse-drawn machines harvested and bundled rice for field drying and threshing, yielding 2,300 pounds/acre. In the 1930s, agricultural engineers developed a mechanized direct combine and drying technology that improved harvest efficiency and rice quality. UC Davis scientists also improved fertilizer management; weed, insect, and disease control; and grain quality. By 1970, yields topped 5,500 pounds/acre. With improved rice varieties developed by the grower-funded Rice Experiment Station, UC Cooperative Extension, and UC Davis, yields now exceed 8,000 pounds/acre. Research has also helped rice farmers meet water- and air-quality goals, and improve wildlife habitats.

JACK KELLY CLARK/UC ANR



1907: Davisville is renamed Davis in order to avoid confusion with Danville.

1908: The first students — farmers — arrive on campus in October for farming short courses.

1909: First semester enrollment totals 18 farm school students and five university students.





Monitoring for codling moths in a walnut orchard for more precise pest control.

JACK KELLY CLARK/UC ANR

## INTEGRATED PEST MANAGEMENT

Everyone from home gardeners to commercial growers has access to practical, science-based information on pest management from a program established in 1979 and based at UC Davis — the UC Statewide Integrated Pest Management Program (IPM). Researchers have helped reduce pesticide usage and developed safer methods of pest control for California cities, farms, ranches, and forests. IPM focuses on long-term prevention of pests through a combination of techniques that include biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties.



SPECIAL COLLECTIONS, SHIELDS LIBRARY/UC DAVIS

## ENTOMOLOGY: A FOUNDING DISCIPLINE

Since the early days of the University Farm, campus entomologists have developed information and conducted research on controlling exotic and invasive pests. One of the first efforts helped farmers cope with a whitefly infestation. Early classroom instruction is shown in this undated photo from Shields Library Special Collections.

## SWEET HISTORY OF HONEY BEE RESEARCH

Without honey bees, commercial production of many fruits, nuts, vegetables, and seeds wouldn't be possible. Harry Hyde Laidlaw, Jr., an entomology professor at UC Davis from 1947 to 1974, perfected artificial bee insemination. His work enabled selective breeding of honey bees and the fundamental study of insect genetics. He taught courses in apiculture and entomology and trained beekeepers throughout the world. The honey bee research facility that bears Laidlaw's name investigates important aspects of bee health such as varroa mites, diseases, malnutrition, and colony collapse disorder.

# Insects and Pests

## MEDFLIES AND AGING

In 1992, a landmark study led by UC Davis entomology professor James Carey profoundly influenced the scientific view of human aging. Part of the "Oldest Old" project, it examined the longevity of more than one million Mediterranean fruit flies. Carey's Medfly research revealed that the rate of change in mortality slows at advanced ages, dispelling the notion of a biologically fixed upper limit to human life. The same study also found that lifespan is influenced by a variety of physiological, biological, and behavioral traits, debunking the myth that the females of a species are genetically programmed to live longer.



PHOTO BY SCOTT BAUER/USDA

## GUARDIANS OF VINE AND TREE STOCK

In 1958, a program to maintain and distribute virus-tested grapevines combined with another program providing disease-free rootstock for tree fruits and nuts to become the Foundation Plant Materials Service. Strawberries, sweet potatoes, and roses have since been added to the list of healthy plants provided to commercial nurseries. Now known as Foundation Plant Services, this program is the source for certified premium California grape varieties and new, screened introductions from other wine-producing countries. It also propagates plant material for nurseries and growers throughout the United States and worldwide.

1909: More than 2,200 people attend the first Picnic Day, called Picnic Lunch.

1911: The first nine students complete the Farm School program.

1912: Enrollment exceeds 100, and annual costs to attend are approximately \$250 per student.





Much of America's lettuce is grown in the Salinas Valley.

GARY KRAMER/USDA-NRCS

### VIRUS DISCOVERY HELPED SAVE LETTUCE INDUSTRY

By the early 1950s, the California lettuce industry faced a grave threat from a disease known as "June yellows." Plant pathology faculty at UC Davis determined that the cause of the disease was lettuce mosaic virus. Professor Ray Grogan demonstrated that the important inoculum was a seedborne virus, and he developed guidelines for disease control based on the use of clean seed and specific cultivation practices. This helped combat the major problem facing Salinas Valley growers and helped save the California lettuce industry.



COURTESY OF RAY EVERT, PH.D. '38

### PIONEERING BOTANIST ESAU

Professor Katherine Esau, a world-renowned plant anatomist who joined the faculty in 1932, chronicled the effects of viruses on tobacco and sugar beet plants. She made significant contributions to the field of developmental plant anatomy and helped improve knowledge of plant tissues. Among the first botanists to use an electron microscope, Esau set the stage for many advances in plant physiology and molecular biology.

### THE ROOTS OF WEED SCIENCE

Weed science started at UC Davis. Professor W.W. Robbins, chair of both botany and truck crops from 1936 to 1940, developed a weed research program, and initiated the first courses on weed science taught in the United States. Robbins and his colleagues produced the first college textbook on weed control in 1942.

### WORLD LEADERS IN NEMATOLOGY

Since 1954, UC Davis faculty have been developing research-based strategies for control of plant-parasitic nematodes. Initial research in nematology focused on the collection of different species of nematodes and documentation of their host plants and geographic range. Today, the UC Davis Nematode Collection is one of the largest and most comprehensive in the world, with 64,000 slide- and wet-preserved nematode specimens from more than 90 countries.



Microscopic nematodes attack the root tip of a plant.

CONGLI WANG/UC DAVIS

### NEMATODE ASSISTANCE, NEMATODE RESISTANCE

Professor Dewey Raski and other nematology faculty made breakthroughs in establishing relationships between nematodes and the plant viruses they transmit. As the potential dangers of nematicides were recognized, campus researchers pioneered alternative approaches to nematode control that support sustainable agricultural practices. Since 1976, Professor Harry Kaya has conducted research on insect-parasitic nematodes that has led to their common use as biological control agents of insect pests. In the 1990s, Professor Valerie Williamson found a molecular marker for the *Mi* gene, which protects tomatoes from nematodes. The marker is widely used by breeders to incorporate nematode resistance into tomato varieties grown for processing, reducing the need for chemical control.

1913: Hubert Van Norman is named director of the University Farm.

1914: The federal Smith-Lever Act establishes the Agricultural Extension Service.

1914: The first three women come from UC Berkeley to attend school in Davis.



## THE MECHANICAL TOMATO HARVESTER

In the 1940s, UC Davis vegetable crops researcher Jack Hanna started breeding new tomato varieties that ripen uniformly and could withstand mechanical harvesting. Agricultural engineers Coby Lorenzen and Steven Sluka later joined Hanna to develop a mechanical tomato harvesting system. The machine was successfully tested on the Lester Heringer farm and then commercially developed by the Blackwelder Manufacturing Co. in Rio Vista. It revolutionized the processing tomato industry. The machines cut harvesting costs in half and led to large increases in both tomato acreage and tonnage within California and throughout the world. Those increases provided additional employment in field work, transportation, and processing that more than offset displaced harvesting jobs.



JACK KELLY CLARK/UC ANR

## COOL PRODUCE

Forced-air cooling — the most widely used method of cooling nearly all harvested and packaged tree fruit, berries, melons, tomatoes, and other vegetables — was developed by Rene Guillou, specialist in the Department of Agricultural Engineering, and tested on campus in 1954. In the 1970s, specialist Jim Thompson and colleagues adapted it to cut-flower cooling. Agricultural engineers are currently investigating redesigned produce packaging to foster more uniform and rapid forced-air cooling.

## FARM SAFETY

UC Davis has a long history of farm safety research. In 1956, agricultural engineering faculty were the first in the United States to design a structure to protect tractor operators from injury in the case of an accidental rollover. In the 1980s, the Ag Ergonomics Research Center partnered with grape growers to redesign a picking tub — and a machine to lift it — that reduced worker fatigue. The team developed tools for moving heavy containers in nurseries, as well as a table-top plant cutter. Research also improved ladder designs for work in orchards.

# Agricultural Innovation

## TREE SHAKERS SPEED HARVESTING

During the 1960s, biological and agricultural engineering professor Robert Fridley and others developed the inertial tree shaker, the integrated shake-catch harvester, shaker clamps that minimize damage to tree bark, and criteria for design of fruit-catching surfaces to minimize bruising of fruit during harvesting and handling. Today, nearly all nuts and many tree fruits are harvested with tree shakers. Most shakers are designed from the principles developed by Fridley and his colleagues, and most growers follow their guidelines for tree shaping and pruning.



## SOUNDING THE ALARM

Insects aren't the only pests affecting California vineyards. American Robins, European Starlings, and House Finches can also inflict damage. UC Davis wildlife biologists and agricultural engineers in 2004 and 2005 experimented with electronically produced sounds mimicking the birds' natural alarm and distress calls. This technique proved an effective deterrent and could save growers a bundle.



UNIVERSITY OF CALIFORNIA, REGENTS





### CATTLE NUTRITION REVOLUTIONIZED

UC Davis animal science research has made vast changes in beef cattle nutrition. In 1947, Max Kleiber, an animal husbandry professor, pioneered the use of radioactive isotopes to study animal physiology and the metabolic processes associated with lactation. In the 1960s, animal scientists Glenn Lofgreen and Bill Garrett created the California Net Energy System for finishing beef cattle with precisely calculated feedstuff values in relation to animal nutrition requirements. Further refinements have been made by the computer modeling efforts of faculty members Lee Baldwin, Jim Oltjen, and Roberto Sainz that take into account changing environmental conditions, animal growth, and other factors.

### BEEF QUALITY ASSURANCE

UC Davis animal scientists and veterinarians were among the first in the country to create a Beef Quality Assurance program in collaboration with industry. Its goal is to enhance food safety while reducing costly market problems for producers. The voluntary program, which emphasizes education and safe treatment for livestock diseases, has trained more than 5,000 cattle producers since 1993. Consumers are the beneficiaries of improved beef quality.

### MAKING MILK HEALTHIER

Animal science professor Ed DePeters and dairy technology specialist Moshe Rosenberg (right) developed a diet for milk cows that increases unsaturated fat in milk. The feed supplement, announced in 2003, is based on naturally occurring proteins. Dairy-food processors will also be able to modify food qualities, such as butter texture and cheese flavors.

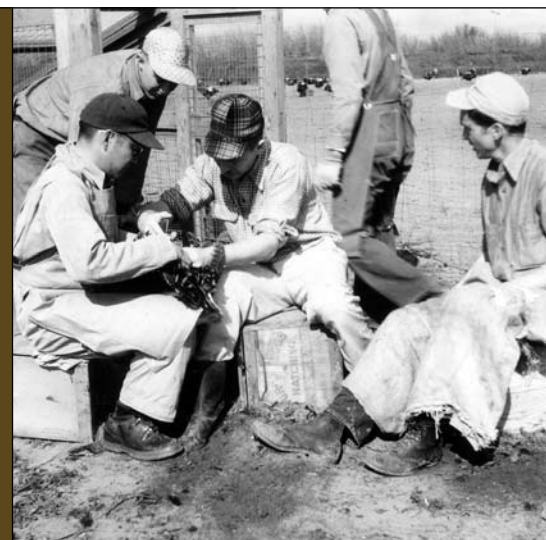


DEBBIE ALDRIDGE/UC DAVIS

### ANSWERS TO LIVESTOCK WASTE

Agricultural scientists have studied improved livestock manure management since the 1960s. In 1992, the college was the first in the country to hire an extension specialist to work on the issue in an environmentally responsible manner. Deanne Meyer helps the industry tap the natural fertilizer potential in manure and minimize water quality problems through the California Dairy Quality Assurance program. Concern over the impact of large-scale confined-animal operations on air quality led to the more recent hiring of specialist Frank Mitloehner. His "bovine bubble" experiments challenging claims that cows rival cars as serious polluters have gained international attention and accolades for facilitating better communication among regulators, the livestock industry, and the environmental community.

## Animal Science



Above, a turkey is artificially inseminated. Techniques demonstrated by UC Davis helped save the turkey industry from ruin.

### GIVING THANKS FOR POULTRY SCIENTISTS

In response to consumer demand for large holiday birds, California's turkey industry successfully bred larger turkeys. Often, these birds were too large to mate naturally. In the 1950s, avian scientists Fred Lorenz and Frank Ogasawara organized teams of UC Davis students to travel the state and show turkey farmers artificial insemination techniques developed by USDA in the 1930s, literally saving the industry from ruination. These techniques are now used throughout the world.

1919: Prohibition begins, halting winemaking activities until revoked in 1933.

1920: The Department of Education is created to prepare secondary school teachers of agriculture.

1922: The University Farm becomes the Northern Branch of the College of Agriculture.





## THE FOUNDATION OF FOOD SCIENCE

Cruess Hall has been home to the Department of Food Science and Technology, the only such department in the UC system, for more than 50 years. It is named in honor of Professor William Cruess (above), who was described as “one of the fathers of modern food science and technology” by colleague Emil Mrak, the second chancellor of UC Davis. During Prohibition, Cruess and colleagues developed innovative products such as fruit cocktail, fruit nectars, and bottled prune juice. They were also the first to discover how to freeze orange juice in 1925. The department will be relocated to the Robert Mondavi Institute for Wine and Food Science this summer.

## QUALITY FRUITS AND VEGETABLES

Postharvest handling, storage, and shipping has long been a focus of UC Davis pomologists — scientists who study fruit. In the 1917-18 academic year, 17 new research projects examined the processing, storage, and packing of dried fruits. In 1932, a course in precooling and storage of deciduous fruits and grapes was offered for the first time. For the last 30 years, the internationally renowned Postharvest Technology Short Course has provided a two-week intensive study of current technological procedures used for handling fruits, nuts, vegetables, and ornamentals globally.



JOHN STUMBOS/UC DAVIS

# Food and Health

## THE KEY TO FRESH IN FRUITS AND FLOWERS

Beginning in the 1970s, Professor Shang Fa Yang and colleagues discovered how the plant hormone ethylene regulates the ripening of fruits and the freshness of flowers. This opened the door to the development of new technologies to prolong the freshness of produce and floral products.



## THE LEGACY OF HEIRLOOM YEASTS

In 1893, food scientist Frederic Bioletti started a yeast collection that helped rebuild the California wine industry after Prohibition. The collection moved from Berkeley to Davis in 1951. The Phaff Yeast Culture Collection, named for professor Herman Phaff, is maintained by specialist Kyria Boundy-Mills (above) in the Department of Food Science and Technology and contains more than 7,000 yeasts, many of them unique. The collection is used for biofuels research and by biotechnology and food ingredient companies searching for yeasts that produce novel enzymes, pigments, and metabolites.

## BREWING PROGRAM CELEBRATES 50 YEARS

The UC Davis brewing program began in 1958 with a \$35,000 brewing pilot plant donated by the Master Brewers Association. Michael Lewis became a brewing science professor in 1964 and expanded course offerings. Today the internationally recognized program is overseen by food science department chair Charles Bamforth. Many UC Davis master brewers now work in large companies or microbreweries. Doug Muhleman, an Anheuser-Busch vice president and UC Davis brewing program alumnus, helped secure a \$5 million donation to build the Anheuser-Busch Brewery and Food Science Laboratory in the new Robert Mondavi Institute for Wine and Food Science.



1922: Claude Hutchinson becomes director of the Northern Branch of the College of Agriculture.

1922: A four-year undergraduate program is offered at Davis.

1925: Walter L. Howard becomes director of the Northern Branch of the College of Agriculture.





DEBBIE ALDRIDGE/UC DAVIS

## TRANSFORMING THE DAIRY INDUSTRY

Instruction to improve creamery practices, butter quality, and cheese began at Davis in 1908. Over the years, faculty research helped improve milk flavors, raw milk handling, sanitation procedures, ice cream quality, and cultured dairy products. In the 1950s, fortification of reduced-fat milk with milk solids improved body and enriched flavor. Research in the 1970s led to a method of concentrating whey proteins for use in processed foods.

SPECIAL COLLECTIONS, SHIELDS LIBRARY/UC DAVIS



## A NEW WHEY TO PROTECT FOOD

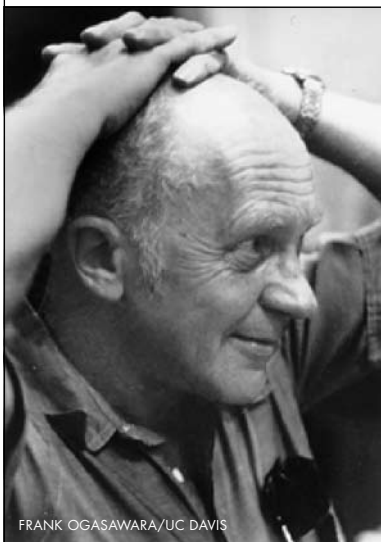
Since 1990, a UC Davis research lab run by food science and technology professor John Krochta (above) has been discovering new ways for the food industry to utilize whey, a byproduct of cheese manufacturing. Edible whey-protein food coatings are a natural way to prevent spoilage and to enhance food safety. Whey-protein film coatings can keep nuts fresh, protect foods like smoked salmon or sliced turkey from bacteria, or be used as films to make sealed pouches for measured amounts of baking ingredients like buttermilk powder. Whey-protein coatings can also be used in place of synthetic coatings for paper and plastic food packaging, thus improving the recyclability of things like paper plates. Other innovative products in development with collaborators in campus textiles and chemistry departments include whey lactose-based polymers that could be used in building insulation and as medical drug-delivery implants.



DAVIN SPINELLA/UC DAVIS

## HEALTHY MOMS, HEALTHY BABIES

Professor Lucille Hurley was one of the first scientists to recognize that maternal nutrition affected fetal development. Hurley, appointed to the nutrition faculty in the Department of Home Economics in 1955, conducted research that demonstrated improvements in maternal nutrition could result in a significant reduction in the frequency of birth defects.



FRANK OGASAWARA/UC DAVIS

## CURBING CHOLESTEROL

Poultry husbandry professor Daniel Peterson (left) discovered in the 1950s that feeding plant sterols to poultry reduced their blood cholesterol. Peterson's research helped lay the groundwork for studies documenting similar effects in humans from naturally occurring plant sterol compounds in the 1980s.

## BREASTFEEDING BABIES

Faculty in the Department of Nutrition are international leaders in research on the importance of breastfeeding in infant and maternal health. Professor Kathryn Dewey's work has illuminated various key factors in breastfeeding, resulting in new child growth charts, recommendations, and public policies for the health of mothers and babies. Professor Bo Lönnerdal's research has advanced knowledge of the individual proteins in breast milk and their biological functions.

## FIGHTING OBESITY

Nutrition research on campus has led to better identification of the factors underlying the development of obesity, and new approaches to its prevention. Judith Stern, distinguished professor in nutrition, has conducted extensive research on obesity and participated in public education about its impact on health. Her efforts have led to new public policies to address the rising obesity epidemic.

1925: Graduate instruction begins at Davis, in conjunction with UC Berkeley.

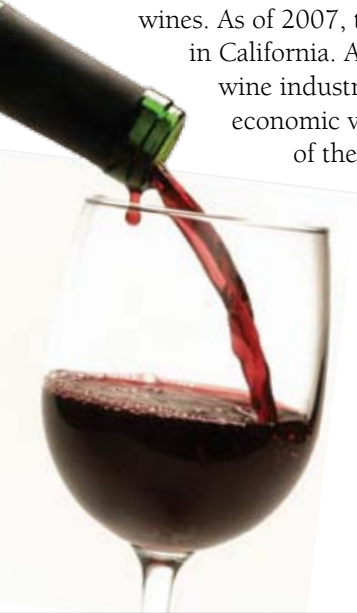
1932: The Quad is seeded with grass instead of barley or alfalfa.

1935: After Prohibition, a course in winemaking is offered for the first time at Davis.



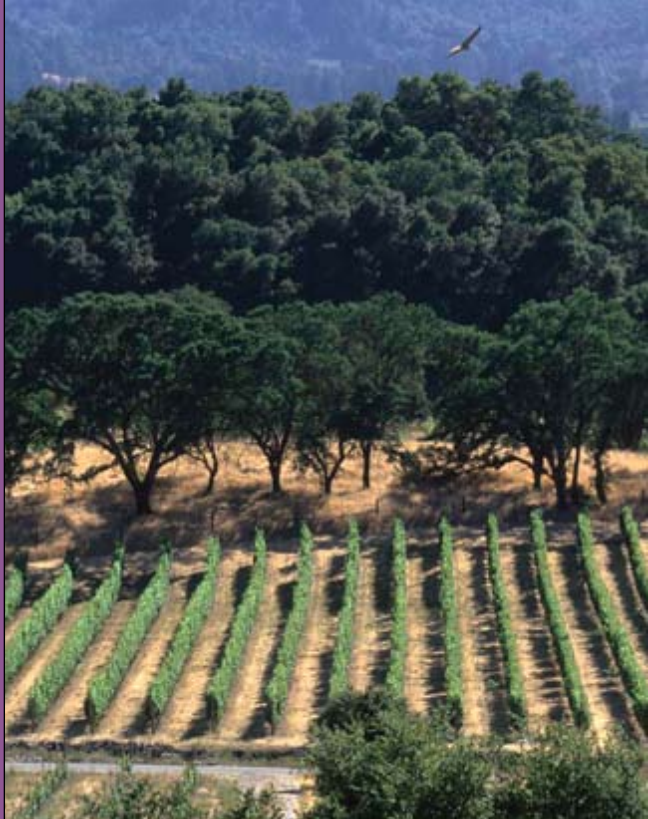
## GROWING A VINTAGE CALIFORNIA INDUSTRY

The study of grape growing and winemaking at the University of California began in Berkeley, years before the Davis campus existed. After the establishment of the University Farm in 1908, viticulture research shifted to Davis. The passage of Prohibition in 1919 suspended research on winemaking until it was repealed in 1933. Since that time, UC Davis researchers — working with UC county farm advisors, California grape growers, and winemakers — have transformed the industry into one of the world's foremost producers of premium quality



wines. As of 2007, there were nearly 2,700 wineries in California. According to the Wine Institute, the wine industry produced nearly \$52 billion in economic value for California in 2007. One of the most important accomplishments of the Department of Viticulture and Enology has been educating students in the scientific method and innovative thinking. More than 1,650 students of grape growing and winemaking have graduated with bachelors', masters', and doctors' degrees. Many have gone on to improve production techniques that increase the quality and sustainability of California viticulture and enology.

# Grapes and Wine



JACK KELLY CLARK/UC ANR

## FINESSING THE GRAPES

Starting in the 1970s, professors Amand Kasimatis and Mark Kliever showed that the local microclimate affects winegrape quality, stimulating the study of trellis systems and canopy management techniques to optimize temperature and light. Beginning in the 1990s, and following Professor Larry Williams, UC Cooperative Extension Specialist Terry Prichard and Professor Mark Matthews proved the value of deficit irrigation in reducing water use while enhancing grape and wine flavor.



The wine cellar, built in 1939, houses more than 60,000 bottles produced by decades of student and faculty winemakers.

CONTEMPORARY PRINT FROM ORIGINAL NEGATIVE BY ANSEL ADAMS, UCR/CALIFORNIA MUSEUM OF PHOTOGRAPHY, SWEENEY/RUBIN ANSEL ADAMS FIAT LUX COLLECTION

## OF FINE STOCK

In 1996, Professor Carole Meredith discovered the parentage of Cabernet Sauvignon — Cabernet Franc and Sauvignon Blanc — through DNA fingerprinting techniques. Subsequently, the parentage and origins of Chardonnay, Syrah, Zinfandel, and other varieties has also been revealed. This marked an important transition from morphologically based identification of grapevines to a much more accurate genetically based method.

## A SENSIBLE APPROACH

Professors Maynard Amerine and Edward Roessler were the first to use statistics to evaluate wine sensory information, making it possible to undertake wine sensory evaluation as a serious scientific endeavor. In 1984, Professor Ann Noble published the Wine Aroma Wheel, allowing wine researchers and consumers to better identify, define, and discuss wine flavors and aromas in an easily understood language.



© A. C. NOBLE 1990

1935: A two-year program in home economics brings more women to campus.

1938: Led by Knowles Ryerson, the campus is renamed the College of Agriculture at Davis.

1941: Redwoods are planted along the south bank of Putah Creek.



## A WINE LEGEND'S GIFT TO THE FUTURE

The transformative power of grape and wine industry improvements is reflected in the unprecedented \$25 million gift from Robert Mondavi (at right, with his wife, Margrit) to support the creation of new state-of-the-art research and teaching facilities at UC Davis. The new complex, opening this summer, will house the Department of Viticulture and Enology, the Department of Food Science and Technology, and the Robert Mondavi Institute for Wine and Food Science (RMI). Sadly, the legendary winemaker and UC Davis benefactor passed away in May 2008. The RMI is destined to become a distinctive landmark at the south entry into campus and strengthen the partnership between UC Davis and California's grape growers and winemakers.



JACK KELLY CLARK/UC ANR

## THE ROAD MAP

Professors Albert Winkler and Maynard Amerine studied the relationship of grape variety, climate, and location to the quality of California wines, categorizing grape-growing regions by heat-summation. Their 1944 landmark publication, "Composition and Quality of Musts and Wines of California Grapes," gave California grape growers a "road map" to making world-class wine.

## BLAZING THE WAY FOR CHARDONNAY

In the 1950s and 1960s, Professor Harold Olmo developed some 30 grape varieties, including Perlette, his first table grape, and numerous wine grapes. His study of the Chardonnay grape led to its economic viability. Chardonnay is now California's most important winegrape variety, cultivated on nearly 100,000 acres throughout the state.

## COOL, CRISP, AND FRUITY

In the 1960s, professors Maynard Amerine and Cornelius Ough introduced cool fermentations for white wine, ushering in a new era in white winemaking, producing crisp, fruity flavors.

## TO YOUR HEALTH

Department faculty collaborated with others on campus during the 1990s to show how wine phenolics are potent antioxidants and anti-inflammatory substances that can slow cancer growth in mice.



JUDY BLEVINS/UC DAVIS

## TECHNOLOGY AND QUALITY

In the 1950s, the department introduced modern sanitation to winemaking, eliminating widespread vinegar contamination of wine. Professor Ralph Kunkee brought sterile filtration to California in the 1970s, eliminating many post-bottling refermentation problems.

1942: Campus closes during WWII and becomes an Army Signal Corps training site until 1945.

1946: Enrollment tops 1,500 as veterans flock to Davis under the GI Bill.

1948: The first four-year graduation ceremony at Davis honors 300 students.



## SOWING THE SEEDS OF PEACE

In 1977, the United States and Israel formed the Binational Agricultural Research and Development program to foster research and scientific exchange on agriculture, food, and natural resource issues. UC Davis is a participant and is helping expand the program to Jordan and Palestine. Workshops have been held on vegetable crop production, postharvest technology, agricultural biotechnology, water scarcity, and other subjects.



## RESTORING AFGHANISTAN'S AGRICULTURE

UC Davis is helping revitalize agriculture in Afghanistan. In 2003, the campus partnered with the nonprofit "Roots of Peace" to provide training for vineyard development and handling of grapes and raisins. CA&ES professors and extension specialists have also provided horticultural training for Afghans and developed production manuals for apricots, pomegranates, and citrus. A certified nursery industry for almonds is also in development. Local production of fruits, nuts, and vegetables will alleviate poverty, meet human nutritional needs, and stimulate economic growth.

Chilean President Michelle Bachelet and Governor Arnold Schwarzenegger tour Hopkins Vineyard in June 2008 with viticulture and enology graduate Alysha Stehly (left) and Andy Walker, a professor of viticulture and enology.



UC DAVIS POOL PHOTOGRAPHY

## TRANSFORMING CHILEAN AGRICULTURE

Much of the fresh fruit available in the U.S. during winter is now grown in Chile, a country with a climate similar to California, a complementary growing season, and a crop of UC Davis graduates who transformed the country's agriculture. During the 1960s and 1970s more than 50 Chileans studied agriculture at UC Davis and eventually became professors, government agency heads, and leaders in private industry in their home country. Exports of Chilean fruits, wine, forest products and salmon have grown substantially. Newly forged partnerships between UC Davis and Chile are supporting research into seed biotechnology, viticulture, and enology.

Global Involvement

## SHAPING NATIONAL AGRICULTURAL POLICY

The National Research Initiative, a competitive grants program that supports academic research, was established in response to a 1989 report developed under the leadership of former UC Davis chancellor Theodore Hullar and former CA&ES dean Charles Hess. The report — "Investing in Research: A Proposal to Strengthen the Agricultural, Food and Environmental System" — was written for the National Research Council's (NRC) Board on Agriculture. As the USDA assistant secretary of agriculture for science and education, Hess was instrumental in gaining White House and Congressional support for the report's proposals and turning it into a Presidential Initiative in the 1990 USDA budget.



## HELPING FARMERS IN EGYPT

In the late 1970s and early 1980s, UC Davis scientists helped Egypt modernize rice farming and improve the productivity and storage life of fruits, vegetables, and flowers. The Agricultural Development Systems Egypt Project helped boost yields and quality in tomatoes, garlic, citrus, olives, grapes, and date palms. The Egypt Project involved more than 130 UC Davis faculty, staff, and graduate students. Since 2003, campus faculty have renewed efforts in Egypt, conducting workshops and organizing farmer associations for small-scale growers.

1948: The campus has approximately 1,400 students, and the city has a population of 2,700.

1952: The College of Agriculture at Davis separates from UC Berkeley; the first dean is Fred Briggs.

1959: UC Davis becomes an independent UC campus with 2,000 undergrads and 650 graduate students.





ELEN GUTTAURO/UC DAVIS

The cover illustration from "Surface Irrigation," a guidebook for more efficient water management.

## A CENTURY OF IRRIGATION

Irrigation research goes back to the beginning of the University Farm and continues today. Experiments on sugar beets date to 1908, followed by work on alfalfa, field crops, an orchard, and a vineyard. The Division of Experimental Irrigation, established in 1913, investigated water rights and supplies, proposed irrigation district boundaries, and helped create the California Water Plan. Frank Veihmeyer, Arthur Hendrickson, and others established the principles of water, soil, and plant relations in deciduous fruits and grapes. Their nearly 30 years of landmark research in the first half of the 20th century shaped orchard and vineyard practices throughout California and set the stage for cultivation of arid lands worldwide. Farmers learned how to create irrigation ditches, lay pipelines, and other "practical" know-how. In the 1930s and early 1940s, Jerald Emmett Christiansen pioneered sprinkler irrigation science. In 1950, the college became the first in the country to offer a master's degree in irrigation science. Horticultural research in the 1980s and 1990s led to reductions in water (and fertilizer) applied in flower and nursery operations. In the late 1980s, the Department of Land, Air and Water Resources began publishing practical "how to" manuals on drip irrigation and other water-conserving technologies for growers of row crops, trees, and vines. Recent major advances include fine-tuned irrigation timing in grapes and subsurface drip irrigation of processing tomatoes.

## AGRICULTURAL WASTE SALT USED IN APPAREL INDUSTRY

In 2001, researchers found a way to recover excess salt in California's agricultural drainage water for use in dyeing textiles. Faculty from the Division of Textiles and Clothing collaborated with faculty from the Department of Biological and Agricultural Engineering to devise a method to recover and purify sodium sulfate, which is used by apparel companies in the dyeing process. The process converts agricultural waste into a marketable industrial product.

## CIMIS SAVES WATER (AND \$\$\$)

California farmers who use the California Irrigation Management Information System (CIMIS) have saved a lot of money in the last quarter century. In one recent estimate, growers saved \$65 million annually in reduced water and energy costs on nearly 364,000 agricultural acres. CIMIS, which calculates precise plant water requirements from weather station data, was developed in 1982 by water scientists at UC Davis and the California Department of Water Resources.

# Water Resources



## DESIGNING THE CALIFORNIA AQUEDUCT

During the 1960s, Jaime Amorcho, a professor of engineering and water science, helped design the California Aqueduct, one of the world's most elaborate water-delivery systems. Working with the state Department of Water Resources, he conducted hydraulic testing of structural models in a special lab on campus for the aqueduct and the Tehachapi Pumping Plant, both the largest structures of their kind at the time of construction.

1961: The Graduate Division is established at UC Davis, independent of Berkeley.

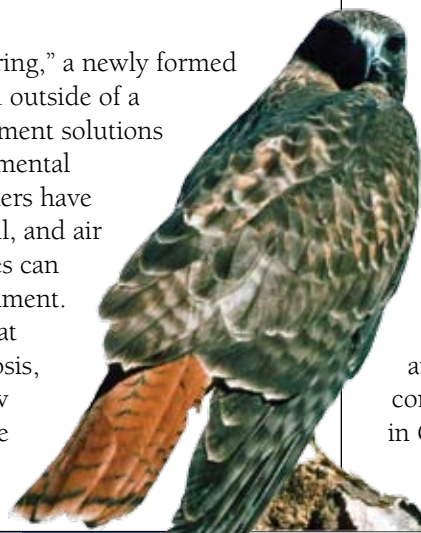
1963: James Meyer is named the second dean of the College of Agriculture.

1966: The Experimental College begins.



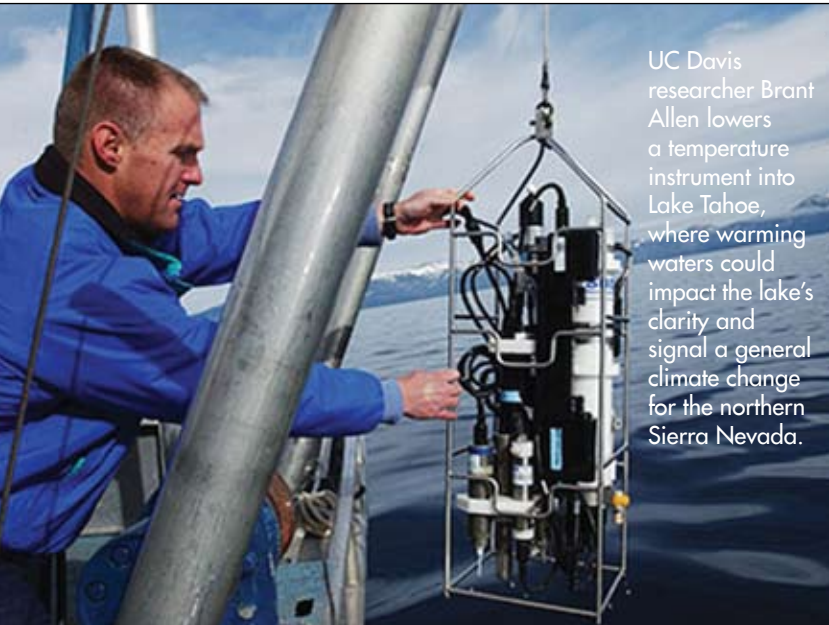
## FIRST ENVIRONMENTAL TOXICOLOGY DEPARTMENT

In 1961, shortly before the publication of Rachel Carson's "Silent Spring," a newly formed Department of Environmental Toxicology became the first of its kind outside of a medical school, leading to the creation of safe, effective pest-management solutions for California agriculture. Alumni now work in government environmental protection agencies, private industry, and academia. Faculty researchers have developed methods to track the movement of chemicals in water, soil, and air that are in use throughout the world. Advanced molecular techniques can detect the presence of contaminants in tissues, food, and the environment. Toxicologists can also monitor compounds in dietary fats and oils that are associated with cancer, Alzheimer's disease, diabetes, atherosclerosis, and AIDS. Department toxicologists also helped pioneer another new field — environmental metabolomics — through magnetic resonance technology that "sees" how toxic chemicals affect metabolic health.



## RAPTOR CENTER SOARS

In 1972, avian sciences professor Frank Ogasawara and several students founded the UC Davis Raptor Center, which treats and rehabilitates injured hawks, eagles, owls, and other birds of prey. The center is also a resource for research and public education on conservation biology. Formerly in CA&ES, it joined the School of Veterinary Medicine in 1980.



UC Davis researcher Brant Allen lowers a temperature instrument into Lake Tahoe, where warming waters could impact the lake's clarity and signal a general climate change for the northern Sierra Nevada.

DEBBIE ALDRIDGE/UC DAVIS

## SAVING LAKE TAHOE

Four decades of environmental and policy research by many scientists at UC Davis are at the heart of efforts to preserve Lake Tahoe. Professor Charles Goldman, a specialist in the study of fresh water ecosystems, was instrumental in alerting the public about the lake's declining clarity.

# The Environment

## SIZING UP THE SIERRA

At the request of Congress in 1992, scientists from top western universities began an ecological, economic, and social assessment of the Sierra Nevada. The Sierra Nevada Ecosystem Project, led by UC Davis wildlife and fisheries professors Don Erman and Deborah Elliott-Fisk, developed tools for decision makers at all levels of government. It was the first study to consider humans as part of an ecological system on such a large scale.

See project findings at [www.ice.ucdavis.edu/snep](http://www.ice.ucdavis.edu/snep)



LEE FITZHUGH/UC DAVIS

## RANGELAND STEWARDSHIP

Since 1990, owners and managers of more than one million acres of rangeland have learned how to improve water quality through a voluntary Rangeland Watershed Program developed at UC Davis. Short courses conducted in rural areas with UC Cooperative Extension farm advisors teach practices to filter sediment, nutrients, and pathogens from runoff water. Studies to improve water supply, grazing capacity, noxious weed control, and soil conditions date back to the 1930s.

JACK KELLY CLARK/UC ANR



## WILD-ANIMAL CONTROL

Walter E. Howard specialized in limiting damage from wild animals, especially rodents, coyotes, and other vertebrates. He was a principal figure in wildlife-damage management, founding the Vertebrate Pest Conference in 1962. Professor Howard visited about 100 countries during a 40-year career that started in 1947.

1967: The College of Agriculture is renamed the College of Agricultural and Environmental Sciences.

1967: The semester system is replaced by a quarter system.

1967: Double-decker buses are purchased by the Associated Students of UC Davis.





JURGEN GEIST

## KEEPING A WATCH ON NATIVE FISH

In 1970, fisheries professor Peter Moyle (above) began studying California native fish. His work documenting declines in coastal coho salmon, delta smelt, and other species led to watershed protections and profound changes in water management. Moyle led efforts to restore stream flows in Putah Creek (near UC Davis), where populations of native fish, including chinook salmon, have rebounded. Lessons learned about river restoration on Putah Creek are being applied to the currently dry San Joaquin River to bring back its spring-run chinook salmon.

## A PRIZED TROUT RETURNS

A watershed restoration program begun in 1987 is restoring northeastern California's prized Eagle Lake rainbow trout, a potentially at-risk species, to its native spawning habitat in Pine Creek. CA&ES and UC Cooperative Extension scientists, working with natural resource agencies, are tracking tagged trout to detect stream features hindering upstream migration and spawning success.



LEE FITZ/JGSI/UC DAVIS

## VIGIL FOR THE BROWN PELICAN

Wildlife biology professor Daniel Anderson was among the first scientists to recognize that certain pesticides were linked to eggshell thinning and population declines in pelicans and cormorants. Anderson joined the Department of Wildlife and Fisheries Biology in 1976 and monitored the Brown Pelican through its population crash and later through its recovery. He and colleagues are studying the impacts of El Niño, environmental contaminants, and other human disturbances on coastal seabird populations and in other wild birds. This research has been instrumental in the creation of ecological reserves in California and in Baja California.

## SOLUTIONS IN MARINE SCIENCE

Since it opened in 1966, researchers at the Bodega Marine Laboratory (BML) have investigated issues ranging from the life history of red abalone to “ecosystem services” provided by sea grasses. In the 1990s, BML played a crucial role in efforts to save winter-run chinook salmon in the Sacramento River. Other critical research areas include marine upwelling, invasive species, biodiversity, coastal estuaries, and climate change. The lab, part of UC Davis, draws researchers from dozens of agencies and universities, including many CA&ES scientists. Recent work includes the study of environmental standards for ocean fish farms and a damage assessment to Pacific herring after the 2007 Cosco Busan oil spill in San Francisco Bay.

DEBBIE ADRIDGE/UC DAVIS



## BUILDING A FRAMEWORK FOR SUSTAINABLE FISHERIES

Environmental sciences professor Alan Hastings and fisheries professor Louis Botsford are leaders in modeling the design of marine-protected areas — reserves to sustain fisheries and preserve biodiversity. Their work has been fundamental in designing and implementing marine reserves in California, the Bahamas, and other areas. Marine fisheries specialist Christopher Dewees is an expert in fisheries “quota” systems that allocate a percentage of total catch to individuals or groups. He researched the impact of quota management systems on fish stocks, the fishing industry, and fishing communities in New Zealand and elsewhere.

1969: Chester McCorkle is named the third dean of the college.

1970: Alex McCalla is named the fourth dean of the college.

1970: The Whole Earth Festival is created to celebrate the first Earth Day.



## ARBORETUM A HAVEN FOR OAKS

The UC Davis Arboretum, established in 1936, is a 100-acre public garden with more than 22,000 trees and plants. It specializes in plants adapted to a Mediterranean climate, and has one of the largest scientific collections of mature oaks in the southwestern United States — 574 trees representing 95 oak species, varieties, and hybrids. The trees are concentrated in Shields Grove, but are also located along the old north channel of Putah Creek. The Arboretum is a frequently used resource for education, research, and aesthetic enjoyment.

# The Natural World



SHANE WADDELL/UC DAVIS

## NATURAL RESERVE SYSTEM

The UC Natural Reserve System is the largest and most diverse set of university-owned and operated reserves in the world. Its 33 reserves include examples of nearly every major ecosystem in California, and provide secure sites for long-term environmental research, student teaching, and public outreach. Six Northern California reserves are administered by the UC Davis campus. Three-quarters of the researchers and instructors who use them are from CA&ES, and the college is a leader in obtaining funding to help the reserves flourish.

## ENTOMOLOGY MUSEUM STORES SEVEN MILLION INSECTS

The R.M. Bohart Museum of Entomology, founded in 1946, is home to one of the largest insect collections in the United States. It includes more than seven million specimens from all over the world. The insects are acquired through field-research programs and donations by faculty, students, and private sources. The museum is open to the public and also provides services such as surveys to assist with land-use decisions, forensic entomology, K-12 education, and diagnosis of structural and exotic pests.



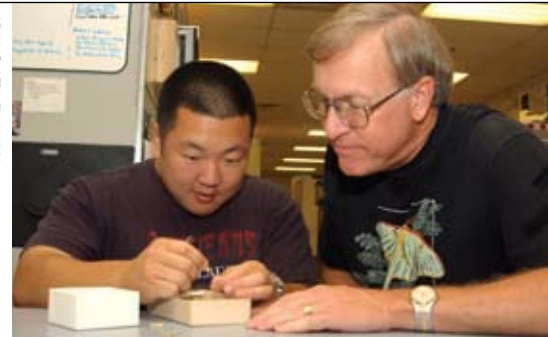
DEBBIE ALDRIDGE/UC DAVIS

## A TREASURE TROVE OF PLANTS

In 1922, Professor W.W. Robbins founded the Botany Department at the University Farm and started a reference collection of agricultural weeds, poisonous plants, and other botanical specimens. Over the years, this collection was joined with agronomy and viticulture collections to form today's UC Davis Center for Plant Diversity Herbarium. It contains more than 300,000 pressed and labeled plants, including many California natives. Information from specimen labels is also used in guidebooks and to monitor noxious weeds and rare plants.

## A WINDOW INTO BIODIVERSITY

The Museum of Wildlife and Fish Biology, founded in 1972, houses more than 35,000 specimens of mammals, birds, and fish from California, Alaska, the Southwest, Baja California, the Pacific Ocean, and other countries. Specimens, some dating to the 1800s, have been acquired from expedition research, faculty and student projects, and "orphaned" collections. The museum supports 35 UC Davis courses. Staff conduct surveys of living wildlife in the western U.S., ecological studies in California and Chile, and endangered species recovery in the Hawaiian Islands.



KATHY KEATLEY GARVEY



## AGGIE AMBASSADORS

Since 1998, the student-run Aggie Ambassador program sponsored by CA&ES has taken a major public relations role for the campus. The program has about 70 active student members who lead campus tours and visit local schools and colleges to promote awareness of opportunities in agricultural and environmental sciences and life as a UC Davis Aggie. To learn more, contact them at [agambassadors@ucdavis.edu](mailto:agambassadors@ucdavis.edu).



## STUDENT FARM GROWING STRONG

The 20-acre Student Farm, established in 1977, has grown into an oasis of organic and sustainable agriculture education and research under the leadership of Mark Van Horn. Students grow farm-fresh organic produce for “subscribers” and the student coffee house. Many Aggies have also learned the nuances of composting, the art of tractor driving, or had their first exposure to agricultural research there. Every spring, hundreds of Northern California grade-school children tour the farm (above) for hands-on experiences in agriculture, nutrition, and ecology.

1978: The first endowed professorships are established in entology and animal science.

1980: Female undergraduates outnumber males, a trend that continues today

1987: Undergraduate enrollment tops 15,000, with 5,091 graduate students.

# The Student Connection

## SCIENCE EDUCATION FOR THE SENSES

Four CA&ES classes are perennial winners in the annual “Best of Davis” section of the *California Aggie*. “Nutrition 10,” “Food, Folklore, and Health,” “Introduction to Brewing and Beer,” and “Human Sexuality” are frequently named best “general education requirement.” Thousands of students from every major on campus have squeezed into large lecture halls over the years to get a spot in these engaging science classes. They study useful life skills such as proper nutrition, food science, sexual health, and the science behind a really good beer.

## THE FLYING CLASSROOM

“Aerial Study of Natural Resources of California” was an innovative, thought-provoking class offered in resource sciences during the 1970s. The popular course engaged students in group study of natural resources and their use in society. The field trip was a Saturday flight in the “flying classroom,” a chartered Boeing 737 in which students took turns giving presentations about the resources below — from the Grand Canyon to the Oregon border. The class was the brainchild of lecturer Harry O. Walker, who joined the CA&ES faculty in 1955 and mentored hundreds of grateful undergraduates for four decades. Walker was an early and vocal advocate for the name change in 1967 from the College of Agriculture to the College of Agricultural and Environmental Sciences.



## WHAT'S NEW ON THE FARM

Picnic Day, the annual UC Davis open house held each April, is one of the largest student-run events in the nation. It celebrates the richness of campus life and the diverse achievements of students, staff, and faculty with a wide range of educational displays, activities, and entertainment. The first Picnic Day in 1909 showcased a new dairy barn. A student-run event since 1912, Picnic Day now draws more than 50,000 visitors.







## YOUTH DEVELOPMENT

The 4-H Center for Youth Development (CYD), part of the Department of Human and Community Development, fosters research that deepens our understanding of youth development. In collaboration with county-based Cooperative Extension staff, CYD supports the national 4-H program, which was created nearly 100 years ago to provide meaningful extracurricular learning opportunities for youth.

## MEXICAN AMERICAN FAMILIES

The California Families Project is the first long-term study on the development of children of Mexican origin living in California. Directed by Rand Conger, distinguished professor in the Department of Human and Community Development, the study began in 2005. It examines the values, traditions, and childrearing practices in Mexican-origin families that are expected to promote successful development of Mexican American children as they enter adolescence. The study relies on in-depth interviews of 650 Mexican American families in the Sacramento area.

## EMPOWERING PEOPLE

Rural sociologists Orville Thompson (right) and Isao Fujimoto were leaders in the development of “applied behavioral sciences” at UC Davis during the 1960s. Thompson was responsible for the beginnings of the Internship and Career Center and the undergraduate advisor program. A popular mentor, he taught students that they would achieve more in life through their influence on others than what they did as individuals. Fujimoto worked to empower disenfranchised segments of rural California, helped launch the ethnic studies program, and encouraged students to use their gifts for the common good. Their legacy today is known as the Department of Human and Community Development.



# Social Change



JULIA LUCKENBILL/UC DAVIS

A two-year-old uses symbolic gestures to tell her teacher that she found a photo of a pig.

## BABY SIGNS

The Early Childhood Laboratory in CA&ES was the first infant-toddler program to pilot the symbolic gesture concept, a technique for communicating with children too young to express themselves using verbal language. “Baby signs” are modified American Sign Language signs that are paired with everyday words or phrases. Research on the effectiveness of the gestures was pioneered in the 1990s by UC Davis psychology professor emeritus Linda Acredolo and Susan Goodwyn, now a professor at California State University, Stanislaus. Since then, the use of “baby signs” has become increasingly popular among parents and early childhood caregivers.

## THRIVING VS. SURVIVING

Emmy Werner, professor emeritus in human development, conducted a longitudinal study of more than 500 children in Kauai that found many high-risk children displayed resilience and developed into normal, happy adults despite difficult developmental histories. Her research, which spanned four decades, identified a number of protective factors in the lives of resilient individuals that helped to balance out risk factors at critical periods in their development. This work was named by Harvard University and Radcliffe College as one of 12 landmark studies of the 20th century at a conference on life course studies.



## REACHING OUT TO HELP PEOPLE

The first UC Cooperative Extension specialists helped California farmers a century ago with applied agricultural research when California was still young and farming was the main industry. UC Davis still has plenty of CE specialists who work with county-based CE programs to address real-world rural and urban issues such as sustainable farming, wildlife management, forestry, water and air quality, marine sciences, youth and community development, nutrition and food safety, and global trade.

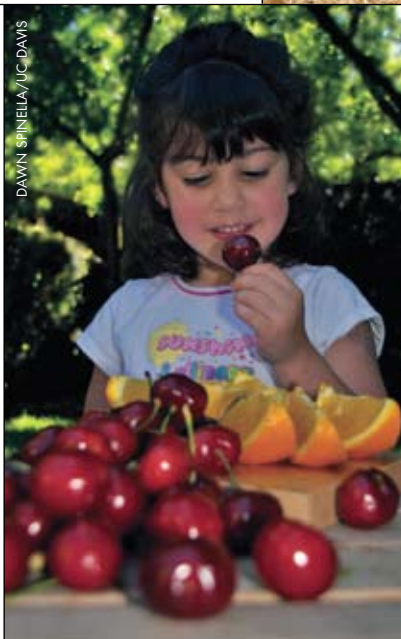


## PLANNING TOOLS FOR FARM FAMILIES

“Cost and Return” studies have been helping California farmers and ranchers make good decisions for decades. They help producers determine which crops and production methods make sense for a region by comparing a commodity’s potential value against production costs for seeds, fertilizer, pesticides, water, labor, insurance, property taxes, land, machinery, and many other items. They’re available for a wide range of crops and have been produced by economists in the Department of Agricultural and Resource Economics, county farm advisors, and Cooperative Extension specialists since 1937.

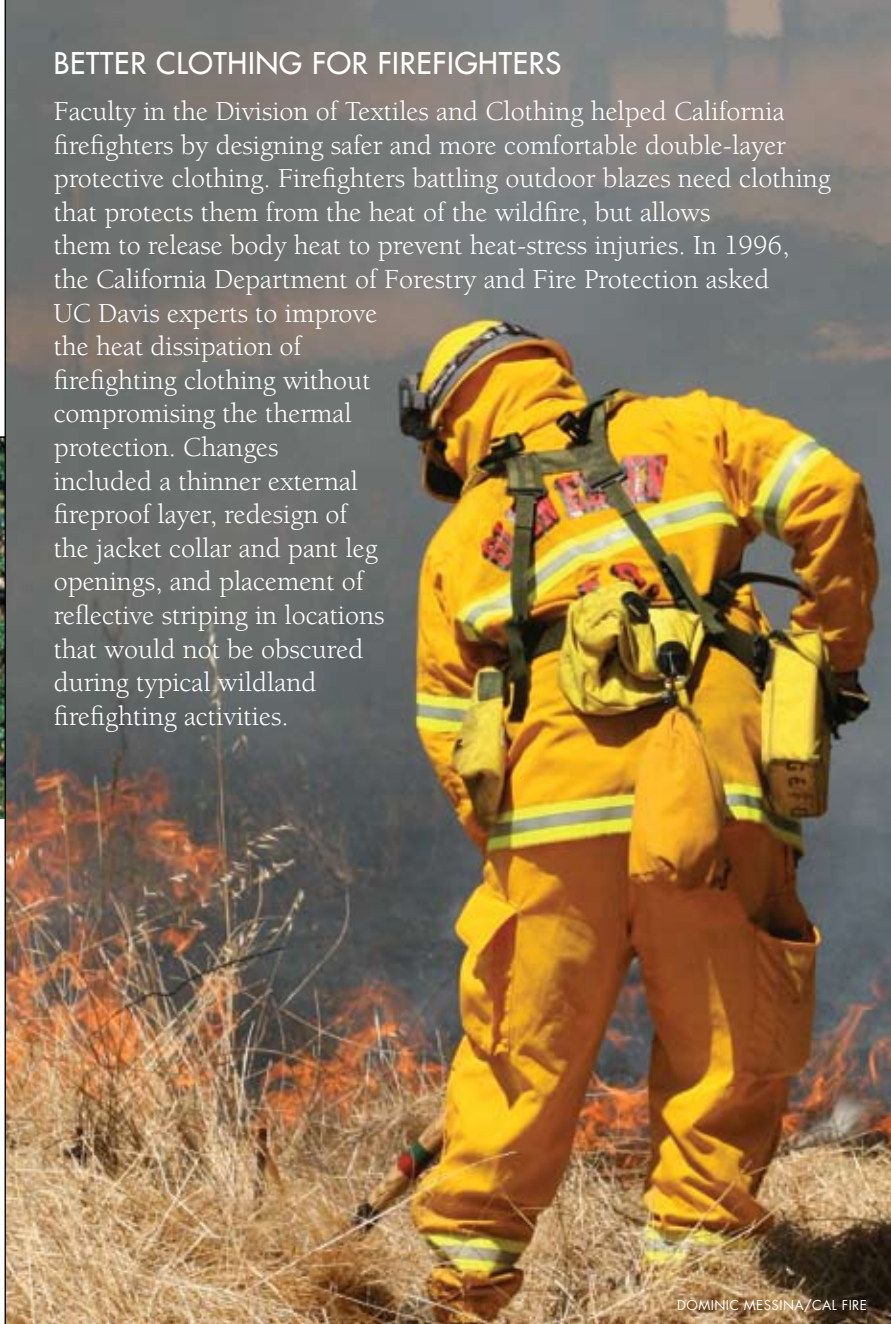
## TEXTILES BATTLE BACTERIA

In recent years, faculty in the Division of Textiles and Clothing developed antibacterial textiles that have applications in medicine, agriculture, and the military. The biocidal and chemical-detoxifying textiles developed by Professor Gang Sun are used in medical uniforms and bed linens, as well as odor-free garments, clothing that minimizes exposure of agricultural workers to residual pesticides, and clothing that protects military personnel from biological and chemical agents.



## BETTER CLOTHING FOR FIREFIGHTERS

Faculty in the Division of Textiles and Clothing helped California firefighters by designing safer and more comfortable double-layer protective clothing. Firefighters battling outdoor blazes need clothing that protects them from the heat of the wildfire, but allows them to release body heat to prevent heat-stress injuries. In 1996, the California Department of Forestry and Fire Protection asked UC Davis experts to improve the heat dissipation of firefighting clothing without compromising the thermal protection. Changes included a thinner external fireproof layer, redesign of the jacket collar and pant leg openings, and placement of reflective striping in locations that would not be obscured during typical wildland firefighting activities.



## KEEPING THE FOOD SUPPLY SAFE

When astronauts first went into space, scientists created a safety checklist into reduce the chances of something going wrong — Hazard Analysis of Critical Control Points. The “HACCP” concept has been adapted in many segments of society. The seafood industry, for instance, was an early adopter of the concept and has turned to UC Davis for more than 20 years for information on how to improve processing, storage, and handling. Similarly, a great deal of research and education has been conducted by UC Davis researchers with the fresh fruit and vegetable industries to help growers and processors limit contamination from microorganisms like *E. coli* and salmonella. Many CA&ES departments and programs offer publications, trainings, and public education to keep the food supply among the safest in the world.

1999: Neal Van Alfen is named the eighth dean of the College of Agricultural and Environmental Sciences.

2001 : UC Davis has more than 20,000 undergraduates and about 5,500 graduate students.

2001: A \$25 million gift establishes the Robert Mondavi Institute for Wine and Food Science.





TEMPORARY PRINT FROM ORIGINAL NEGATIVE BY ANSEL ADAMS, UC / CALIFORNIA MUSEUM OF PHOTOGRAPHY, SWEENEY/RUBIN ANSEL ADAMS FIAT LUX COLLECTION

In 1967, students riding bicycles on the central campus no longer had to compete with cars.

## PEDAL POWER

In 1967, UC Davis closed the central campus to cars, and the city of Davis created the first dedicated bike lanes on city streets in the United States. Today, Davis has 50 miles of bike lanes and 50 miles of off-street bike paths, all in a city of 10 square miles. The bike lane design standards established by Davis were subsequently adopted as part of the state and federal highway codes. One of the early supporters of biking in Davis was Chancellor Emil Mrak, who helped shepherd the growth of Davis from a farm school of 2,000 to an autonomous campus of 10,000 between 1959 and 1969. In acceptance letters sent to newly admitted students, Mrak advised them to bring a bike to campus to get to class on time.

## A "GREEN WAY" TO OPEN SPACE

The Davis Greenway — a multi-use system of parks, playgrounds, trails, and natural areas designed to connect all parts of the city into a seamless network of green spaces — was developed more than 20 years ago by landscape architecture professor Mark Francis. The nationally honored plan is now about 60 percent complete. It remains the principal framework for open space planning in future city growth.



JACK KELLY CLARK/UC ANR

## TRACKING FARMLAND "CONVERSION"

How California can minimize the ongoing loss of productive farmland to urbanization has been at the core of research and outreach by Alvin Sokolow, Cooperative Extension public policy specialist at UC Davis since 1992. Sokolow, previously a UC Davis political science professor for 27 years, worked with the UC Agricultural Issues Center to conduct extensive field research in many California counties and cities. This work has helped identify the social and political forces underlying agricultural land use changes and the effectiveness of varied regulatory and other public policies and programs.

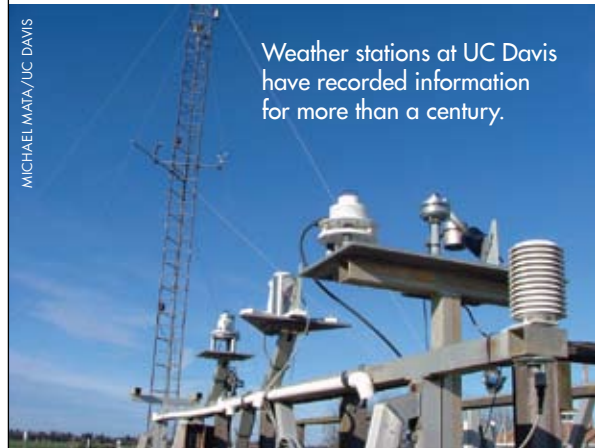
## SUSTAINABLE DEVELOPMENT

CA&ES faculty alerted the public about the need to consider development in terms of sustainability long before the concept became part of the vernacular. Professor emeritus Robert Thayer, founder of the landscape architecture program at UC Davis, began advocating sustainable environmental design in the 1970s, researching and promoting greater reliance on solar and wind energy, as well as other regenerative systems in land use.

## EYEING CLIMATE CHANGE

UC Davis has been collecting weather information — daily temperatures, relative humidity, wind speeds, barometric pressure, precipitation, and other indicators of climate — at several campus locations for at least a century. In 1966, the campus weather station became one of the National Weather Service's 21 benchmark stations to assist in the detection of regional climate change. The station now provides information to a 1,200-station network managed by National Oceanic and Atmospheric Administration called the United States Historical Climatology Network.

MICHAEL WATA/UC DAVIS



Weather stations at UC Davis have recorded information for more than a century.

2002: Private support for UC Davis tops \$100 million for the first time.

2002: Agricultural research funding at UC Davis leads the nation.

2007: The college receives \$12.5 million from the Louise Rossi estate for viticulture and enology.



## 1970s

### Steve Ault

'74, ENTOMOLOGY

Completed 10 years of service with the Pan American Health Organization, a regional office of the World Health Organization. After serving in Guatemala and Brazil, he now serves as regional advisor for parasitology and coordinator for neglected tropical diseases in Washington D.C. He and his family live in Alexandria, Va.

### Barbara Mutti

'75, DESIGN

Worked for 20 years in San Francisco as an art consultant to architects and interior designers for residential and corporate clientele. For the past five years, she spearheaded a homeowners association's success in purchasing their mobile home park and subdividing it so that residents could own their individual lots in Capitola-by-the-Sea, Calif.

### Gregory Noel

PH.D., '77, PLANT PATHOLOGY

Received the Honorary Member Award from the Organization of Nematologists of Tropical America in Carlos Villa Paz, Argentina. He is also a Fellow of the Society of Nematologists. Since graduating from UC Davis, Gregory has spent his career with the USDA, ARS at the University of Illinois.

## 1990s

### Jack Doan

'97, AGRICULTURAL & MANAGERIAL ECONOMICS

Is a Human Resources Manager, Employment and College Relations, for Franklin Templeton Investments in Rancho Cordova, Calif. He lives in Sacramento, Calif.

### Stephanie White Berner

'98, BIOLOGICAL SCIENCE

Recently completed an MBA degree at Stanford University. She is a senior manager for business development at 3Degrees, a renewable energy and carbon offsets company in San Francisco. She and her husband are expecting their first child soon.

## 2000s

### Vivian Watts

PH.D., '03, AGRICULTURAL AND ENVIRONMENTAL CHEMISTRY

Is an application chemist in Alexandria, Va. with Chromsys LLC, a gas chromatography and mass spectrometry business. Vivian returned to the U.S. late last year from his native South Africa, where he had been working as a chemist in the wine industry for four years.

### Galen Williams

'04, BIOTECHNOLOGY

Married Sarah Detrick ('04, Psychology) late last year in Oregon. He works as a research assistant in a glaucoma research group for Discoveries in Sight. Galen and Sarah live in Beaverton, Ore.

### Catherine Cloud

M.S., '05, INTERNATIONAL AGRICULTURAL DEVELOPMENT

Received a 2007 Lindbergh Grant from the Lindbergh Foundation for the project "Promoting Sustainable Agriculture in Mozambique through Junior Farmer Videos." She hopes video technology will help empower children to promote ecologically sound agriculture in Mozambique and other countries worldwide.

### Elaine Sta-Iglesia

'07, ANIMAL SCIENCE

Is a veterinarian nurse in Sacramento. She has a young son and lives in Daly City. Elaine expresses her love of dance and Hawaiian culture through Halau Ka Waikahe Lani Malie Halau Kahulaliwai (Antioch Chapter).

### WRITE US:

[outlook@agdean.ucdavis.edu](mailto:outlook@agdean.ucdavis.edu)

### OR VISIT US ONLINE:

[www.caes.ucdavis.edu](http://www.caes.ucdavis.edu)  
(select "Alumni & Friends")

## GREAT CENTENNIAL EVENTS

### MARK YOUR CALENDAR FOR FALL FESTIVAL

Weekend at UC Davis, Oct. 9-12, 2008, when the campus kicks off its centennial with many gala events.

- The College of Agricultural and Environmental Sciences will hold its **20th College Celebration**, Friday evening, Oct. 10, in Freeborn Hall. The event includes the Award of Distinction presentations, a farmers market, and an assortment of locally grown foods and beverages.

- Robert Mondavi Institute for Wine and Food Science — the **grand opening** of the new complex, which will house the institute, and the departments of Food Science and Technology, and Viticulture and Enology, will occur on Friday, Oct. 10, 10 a.m. Come in the morning for the RMI grand opening and stay for College Celebration.

- On Sunday, Oct. 12, the city of Davis will give UC Davis a **100th Birthday Party**, open to the public, with festivities, displays, and a grand birthday cake.

Visit [www.ucdavis.edu](http://www.ucdavis.edu) and [www.caes.ucdavis.edu](http://www.caes.ucdavis.edu) for more information on these events.



# YOU SAY TOMATO, WE SAY THANK YOU

Industry donations help create a new food science laboratory.

## EVERY TIME YOU PUT KETCHUP ON YOUR FRIES

or enjoy the sauce on your pizza, chances are you're tasting the products of the California tomato industry.

Starting in August each year, trucks full of red, ripe processing tomatoes can be seen rumbling down California highways and byways to companies that



play an integral role in the food industry, such as The Morning Star Packing Company and Los Gatos Tomato Products. These processors transform millions of tons of California tomatoes into paste every summer so food giants like H.J. Heinz and ConAgra Foods can make all those tasty tomato products you enjoy every day.

Many individuals in the tomato industry collectively have made a powerful statement by raising \$2.5 million in donations and equipment to support the new Anheuser-Busch Brewing and Food Science Laboratory at UC Davis. The laboratory will be located within the Robert Mondavi Institute for Wine and Food Science (RMI) complex. The RMI will also be home to the departments of Viticulture and Enology, and Food Science and Technology. The groundbreaking for the Anheuser-Busch Brewing and Food Science Laboratory is planned for Oct. 10, during the Fall Festival.

**Chris Rufer** of The Morning Star Packing Company was inspired to give a lead gift because of UC Davis' importance to the tomato industry. "UC Davis research has helped our industry succeed," Chris says. "We need well-trained graduates for the future and I believe supporting this project will help ensure the continuation of vital hands-on research and education."

Chris has also shown his support for UC Davis research and education by serving on the Dean's Advisory Council for the college. With other generous gifts and pledges from Ingomar Packing Company, Los Gatos Tomato Products, H.J. Heinz, the California Tomato Growers Association, and the California Tomato Research Institute, the industry has raised \$2 million in construction funds for the new laboratory.

The laboratory will include a pilot plant to conduct teaching and research on tomato products and other foods. The space will be properly equipped to process tomatoes thanks to a generous gift of equipment from ConAgra Foods.

The Anheuser-Busch Brewing and Food Science Laboratory will provide a venue for innovations in the rapidly changing fields of food safety, brewing, fruit and vegetable processing, dairy processing, and other areas of research. When completed, it will become one of the premiere sites for scientific collaboration and entrepreneurship in the country.

The facility will be a special source of pride to everyone in California agriculture, since the project will be funded entirely through private support.

— Melissa Haworth

## HOW TO CONTRIBUTE

Additional contributions are crucial to meet the \$10 million fundraising goal. If you are interested in supporting the laboratory project, please contact **Melissa Haworth**, director of development, College of Agricultural and Environmental Sciences, at (530) 754-8562 or [mdhaworth@ucdavis.edu](mailto:mdhaworth@ucdavis.edu).



## FROM BEGINNING TO END

Clinical professor spearheads an early childhood development project.

### GIFT PLANNING TIP

A common misconception is that gift planning happens only when a donor is preparing for the end of life. Gift planning, however, can be done by anyone wanting to maximize charitable giving and minimize tax payments.

Bob Dorn, as a clinical professor and an active volunteer with CA&ES, worked hard to identify donors who could strengthen the college's research program on infancy. It was Bob's financial advisor who informed him that, with careful planning, his assets could be organized to protect the inheritance he wanted to leave his family and establish an endowed chair named after Bob and his late wife, Natalie.

Bob used a mix of tools to make his gift. He contributed \$100,000 from his Individual Retirement Account and approximately \$400,000 in cash and highly appreciated stocks that would have been subject to taxes. He pledged an additional estimated \$500,000 that will be paid with assets strategically selected by Bob and his financial adviser throughout the year. Bob has ensured a long-term impact on a subject important to society, while still honoring his wife and still providing for family members.

For gift-planning help, contact **Christine Schmidt**, CFRE  
(530) 752-6414  
[cmschmidt@ucdavis.edu](mailto:cmschmidt@ucdavis.edu)

Or go online: [http://giving.ucdavis.edu/planned\\_giving.html](http://giving.ucdavis.edu/planned_giving.html)

**ROBERT M. DORN, M.D.**, has spent his professional life as a psychiatrist and psychoanalyst helping adults, adolescents, children, and families. Many of his patients face serious challenges such as depression, anxiety, and interpersonal difficulties. These and other problems often start during childhood and can be addressed

helping young people get the best start possible. He initiated meetings, drafted case statements, and shared his knowledge of the importance of infancy to human development. Bob also spoke with friends who he hoped would help fund the next step — an endowment to support a faculty position focused on infancy.



successfully early in life.

Bob came to UC Davis in the Department of Psychiatry, School of Medicine, as professor and chief of the Child and Adolescent Psychiatry division. He subsequently became a clinical professor. Bob has closely followed research that shows serious lifelong problems can begin as early as pregnancy.

Several years ago, Bob started a discussion with faculty and staff in the College of Agricultural and Environmental Sciences (CA&ES) and the college's Department of Human and Community Development. Bob articulated a vision for

And then Bob phoned the CA&ES Dean's Office in December 2007. "I can be the angel," he said, announcing his plan to contribute and pledge \$1 million to establish the Robert M. and Natalie Reid Dorn Endowed Chair on Infancy.

The faculty member who holds this position will conduct research on social-emotional development in infancy. The department will also provide information to assist caretakers, medical professionals, teachers, and others who interact with parents and families.

— Christine Schmidt



# CA&ES Outlook

College of Agricultural and  
Environmental Sciences #986H  
University of California  
One Shields Avenue  
Davis, CA 95616-8571

**UCDAVIS**

**COLLEGE OF AGRICULTURAL  
AND ENVIRONMENTAL SCIENCES**

*Office of the Dean*



Nonprofit Org.  
U.S. Postage  
**PAID**  
UC DAVIS

## DEAN'S CIRCLE



## ROAD WARRIORS

Norm and Kathleen Schoening share a passion for traveling. Last year they asked themselves which it would be, a Winnebago or a Harley Davidson? The bike won — and so did Max, their English springer spaniel who sports his own custom dog helmet and sunglasses when cruising in the Road King Classic side-car.

A '67 agronomy major, Norm made a career as an Air Force fighter pilot. These days, the retired lieutenant colonel finds the art of pottery and watercolor a relaxing change of pace from life at the speed of

sound. "The fastest I've gone is 2.3 times the speed of sound," says Norm. So far, he hasn't come close to breaking that record on the family Harley.

Kathleen, also a UC Davis alum, is a retired teacher with a reputation for classroom 'crowd control.' In true UC Davis fashion, the couple combined their gardening and agronomy talents to create an eco-friendly, irrigation-conscious front yard for their New Mexico home. The Schoenings last visited campus for Picnic Day several years ago and look forward to many future visits.

## JOIN CA&ES DEAN'S CIRCLE

As a CA&ES Dean's Circle donor, your financial support enhances the academic environment for the next generation of Aggies and creates opportunities for our faculty to achieve higher levels of excellence in teaching, research, and public service.

### ABOUT CONTRIBUTING

- The CA&ES Dean's Circle is open to donors who wish to make unrestricted annual gifts of \$1,000 or more to the College of Agricultural and Environmental Sciences.
- Your donation is renewable annually, and your employer's matching gifts count toward the total.
- Donors to the CA&ES Dean's Circle are invited to campus events such as an annual briefing with the dean. Donors also receive recognition in college publications.

### HOW TO CONTRIBUTE

- A response envelope is included in this issue of CA&ES Outlook so that you can join our prestigious circle of donors.
- If you have questions or need more information, please contact the CA&ES Development Office at (530) 754-8961.
- Visit our Giving website: [www.caes.ucdavis.edu/alumfriends/givingpage](http://www.caes.ucdavis.edu/alumfriends/givingpage)