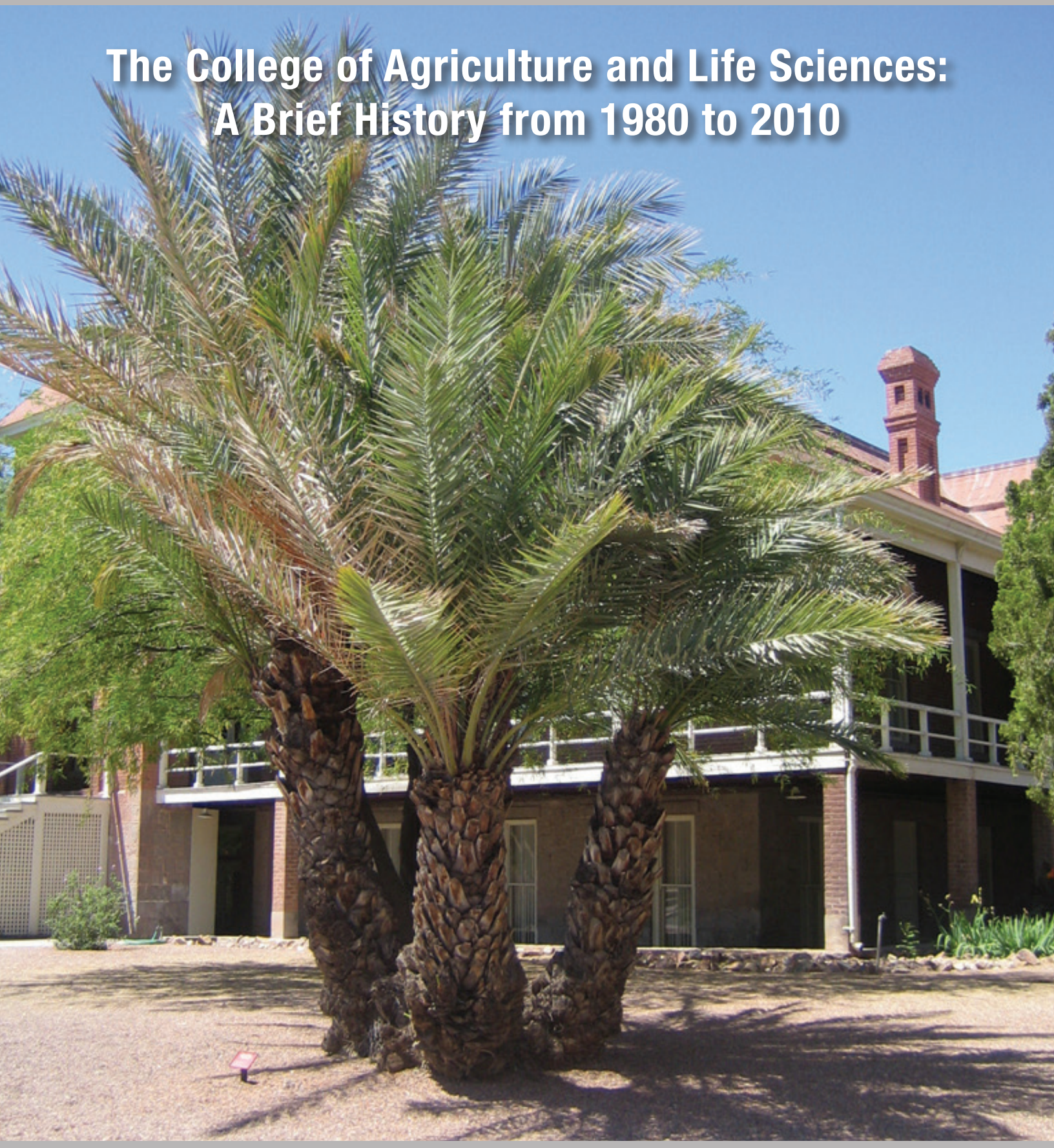
THE UNIVERSITY OF ARIZONA

The College of Agriculture and Life Sciences: A Brief History from 1980 to 2010



by Roger L. Caldwell, Professor Emeritus
College of Agriculture and Life Sciences Tucson, Arizona 85721

The College Of Agriculture And Life Sciences: A Brief History from 1980 to 2010

Vice President and Dean
Eugene G. Sander

Vice Dean
Director, Agricultural Experiment Station
Colin Kaltenbach

Associate Dean
Director of Cooperative Extension
Jim Christenson

Associate Dean
Director of Academic Programs
David Cox

The College of Agriculture and Life Sciences includes, the Agricultural Experiment Station, Cooperative Extension, and the Office of Academic Programs.

The College is an Equal Opportunity Affirmative Action employer.

Produced by
Educational Communications and Technologies

Graphic Designer
Maria del Carmen Aranguren

Director, Publication and Web
Robert Casler

Director, ECAT
Colin Kaltenbach

Contact
news@ag.arizona.edu

cals.arizona.edu/pubs/general/briefhistory.pdf

Contents

March 2011

Cover photo Multi-stemmed True Date Palm (*Phoenix dactylifera*). Planted in 1955 by students from the Iraq College of Agriculture in Abu Ghraib, Iraq, to honor Dr. P.S. Eckert, Dean of the University of Arizona College of Agriculture, for his role in developing their school. It is located on the northeast corner of Old Main

Introduction

This is a summary of the second history written for the College of Agriculture and Life Sciences. The first, *College of Agriculture: A Century of Discovery*, was published in 1985, coinciding with the celebration of the University of Arizona Centennial. It provides the major contrasts from the first University of Arizona employee in 1890 (in the Agricultural Experiment Station) to a college with agriculture at its core but expanded to address natural resources, environment, families, youth, and consumer interests. Initial communication through Cooperative Extension was by railroad car, followed by radio and printed publications and the early stages of electronic mail. When this first history was written, the Phoenix area experimental farms had just been sold, the World Wide Web did not exist, and cell phones as we now know them were just becoming available. In 1984 the Arizona population had just passed the 3 million mark and in 2005, it passed the 6 million mark – a doubling in only 26 years.

This second history begins in 1980 and therefore overlaps with the previous book by five years. This was done because of the way college deans came into office and because 1980 marked a turning point in communications technology with the development of the personal computer. Between 1985 and 2010, there were three deans, Darrel Metcalfe (3 years, counting acting), Bartley Cardon (7 years), and Eugene Sander (23 years). Each inherited a different type of college, in a different situation, and therefore played a different role.

A lot has happened in the past 30 years. Using the World Wide Web (Web) or a cell phone has become a near daily routine for a significant majority of the population. The College changed its name in 2000 from Agriculture to Agriculture and Life Sciences, reflecting its expanded role. The focus on home economics was transformed to youth and families and to retailing and merchandising. Fundamental research in many departments also shifted; while still involving near-term practical agricultural topics, there is a greater emphasis on molecular biology, new methods of pest control, natural resources, environment, and health.

Also changing in this past 30 years were new administrative units through mergers, disestablishment or establishment of schools or departments, shifts in Cooperative Extension Program areas, and acquiring units from elsewhere in the UA, such as the Office of Arid Lands Studies and the Environmental Research Laboratory.
New methods were found for involving faculty and staff in both existing College activities and new directions. There were new avenues for rewarding both faculty and staff as well as Arizona citizens. Many of these changes originated in the external environment – changing needs of the agricultural community, increased faculty disciplines for College research, and a transformation of our scientific tools and techniques. Both the College and the UA have become more integrated across disciplines and more focused on the interactions of how things work rather than approaching problems from the perspective of only one or two disciplines.

So it was time for a new history book.

Overview

- In the 1950s, Arizona begins to change from agricultural to urban populations, the National Science Foundation is formed, the world's first satellite is launched by the Soviet Union (Sputnik), and Arizona reaches 1 million population in 1955. Some high technology firms begin to locate in Arizona.
- In the 1960s, the UA begins a greater emphasis on research.
- In the 1970s, the country undergoes significant shifts (culture, two energy embargoes, new environmental laws, and changes in regulations impacting agriculture). The College reacts to these changes with some successes and some failures.
- In the 1980s, The College makes a number of changes on- and off-campus and in a number of leadership positions, while adapting to major new technological developments. The first endowed chair in the College is created (1986).
- In the 1990s, the Web arrives along with other new ways of communicating.
- In the 2000s, the College changes its name, funding variability continues, audiences change, new "social media" programs arrive, Arizona population reaches 6 million (2005).

Land-Grant Traditions and Changes

The UA is a land-grant institution. The term land-grant comes from gifts (grants) of federal land to the state to provide funding for education. The Arizona Board of Regents (in 1891) had discovered that by taking advantage of the land-grant legislation they would receive funds to complete the first University building, Old Main. For practical purposes that meant there would be a focus on agriculture and include three areas: on-campus instruction, off-campus information, and research. There are three federal acts that are associated with land-grant universities.

These federal acts, as amended over time, caused the colleges of agriculture to have three divisions: the university campus, the agricultural experiment station, and cooperative extension, where "cooperative" indicates partial funding or other resources are provided by counties for local extension offices; counties also appoint an extension advisory board as required by Arizona state law. The federal government provides some funding, which is matched by the state, for the experiment station and cooperative extension.

Nearly a century later, the country and the universities had undergone considerable transformation, and so the Association of Public and Land-Grant Universities established the Kellogg Commission (funded by the Kellogg Company) to address "the future of state and land-grant universities." In 2000 the commission completed a report that served as a basis for discussion in the public and land-grant universities. The commission recognized that both social and college cultures had changed over time and concluded that we were living in a new age and a different world. The commission provided a series of recommendations, including the use of new terminology. For example, it suggested the old terms of teaching, research, and service, be replaced by learning, discovery, and engagement. This is the basis for the College's use of these terms today.

The Morrill Act of 1862 (Section 4) commits the state:

- *"to the endowment, support, and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and mechanic arts, in such manner as the legislatures of the State may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."*

The Hatch Act of 1897 set up the Agricultural Experiment Stations with three purposes:

- *"to promote the efficient production, marketing, distribution, and utilization of products of the farm as essential to the health and welfare of our peoples,*
- *to promote a sound and prosperous agriculture and rural life as indispensable to the maintenance of maximum employment and national prosperity and security,*
- *to assure agriculture a position in research equal to that of industry."*

The Smith Lever Act of 1914 established the Agricultural Extension Service (now Cooperative Extension):

- *"to disseminate and encourage the application of useful and practical information relating to agricultural, home economics, and related subjects among the people of the United States not enrolled in land-grant colleges."*

Arizona and Agriculture

In the 1950s Arizona began to change. Population increased following WWII, central air conditioning became affordable for many in 1957 as the Federal Housing Authority (FHA) began including the cost of central air conditioning as a part of home mortgages. The character of Arizona that had been described as the five C's (Citrus, Cattle, Cotton, Copper, Climate) gave way to a more balanced economy. At that time there was still incomplete mechanization of agriculture, and water had not yet become the key factor it is today. In 1964 a U.S. Supreme Court decision required state legislative districts to be "roughly equal in population." This "one person, one vote" decision, making the state senate composition based on population rather than county, meant that rural counties no longer had a significant political advantage. The Civil Rights Act of 1964 outlawed major forms of discrimination.

In the 1970s there were new environmental laws, and water especially became more of an issue, culminating in the Arizona Groundwater Management Act of 1980. Also during that decade was the beginning of a shift with students and faculty increasingly having less farm or ranch experience. The 1980s were also transformational, with the arrival of desktop computers and urban populations impacting on the Maricopa County experimental farms. A new type of science, molecular biology, began to dominate some older approaches to the field of genetics. In the 1990s the first U.S. Department of Agriculture (USDA) deregulated cotton transgenic plant was

released (insect resistance via *Bacillus thuringiensis*, Bt), and in 1990 the Human Genome project began, producing a fully sequenced genome by 2003).

Agricultural productivity also changed. Yields increased through greater mechanization, greater nutrition and pest control, and improved irrigation (see Table 1).

The World Wide Web began in 1991, but it was not until 1993 and the availability of a graphical browser that the possibilities of the Web began to be understood. Within a few years everyone was facing a totally new technique for communication. Institutions of all types had to first understand what this Web thing was all about, then decide if and how it could be useful to them, and eventually figure how to integrate it into their business operations. Meanwhile, customers and employees were also discovering what the Web was all about and how to use it. Finally, the telecommunications and computer industries had to make sure people could connect to the Web and have affordable computers for interaction. This all effectively happened in less than 5 years. In 2010, about 15 years after the Web started, there are over two billion users worldwide (29% of the world population).

Many in agriculture took advantage of these new communications devices, including one creative farmer who modified a cell phone mounted on his tractor to track the hours used and to automatically call the dealer when service was required. Many students, and others, have become frequent users of Wikipedia, the open information source, which began in 2000.

All of these relatively recent changes impacted the College's audiences and funding, types of research and teaching and approaches to management and operation. Therefore, it is not unexpected that major changes would occur within the College.

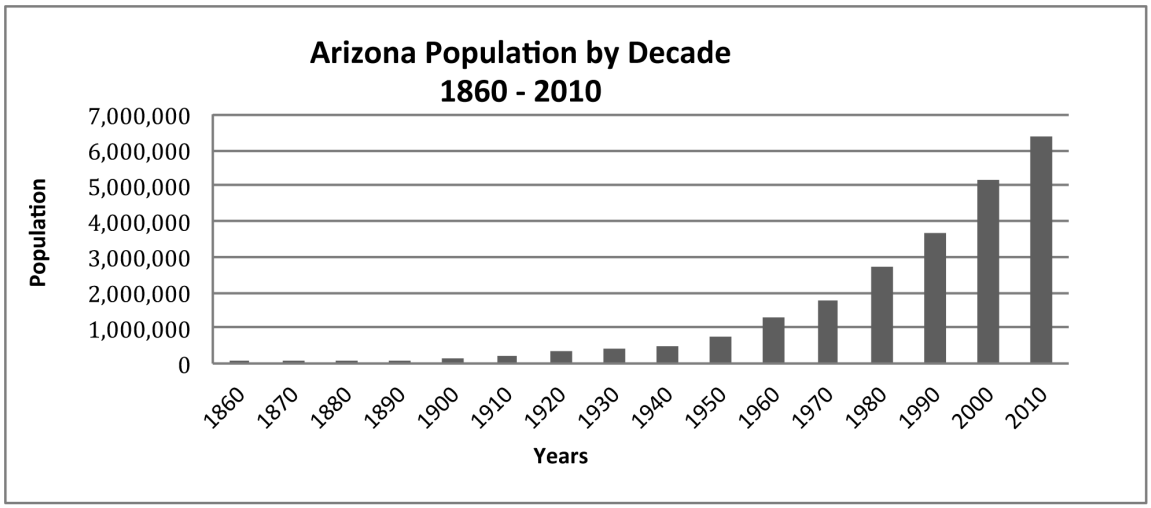
After decades of vigorous growth, Arizona appears to be maturing as the growth rates are trending down even as the actual population has been increasing except for 2010 (see Figures 1 and 2).

Table 1. Comparison of Arizona Agricultural Yields, 1950 - 2010

Crop/Product	Units	1950	1980	2010
Cotton	Pounds/Acre	825	1158	1485
Hay	Tons/Acre	2.6	6.5	8.2*
Sorghum	Bushels/Acre	44	80	85*
Wheat	Bushels/Acre	25	80	112
Milk	Pounds/Head	5,900	13,747	23,028*

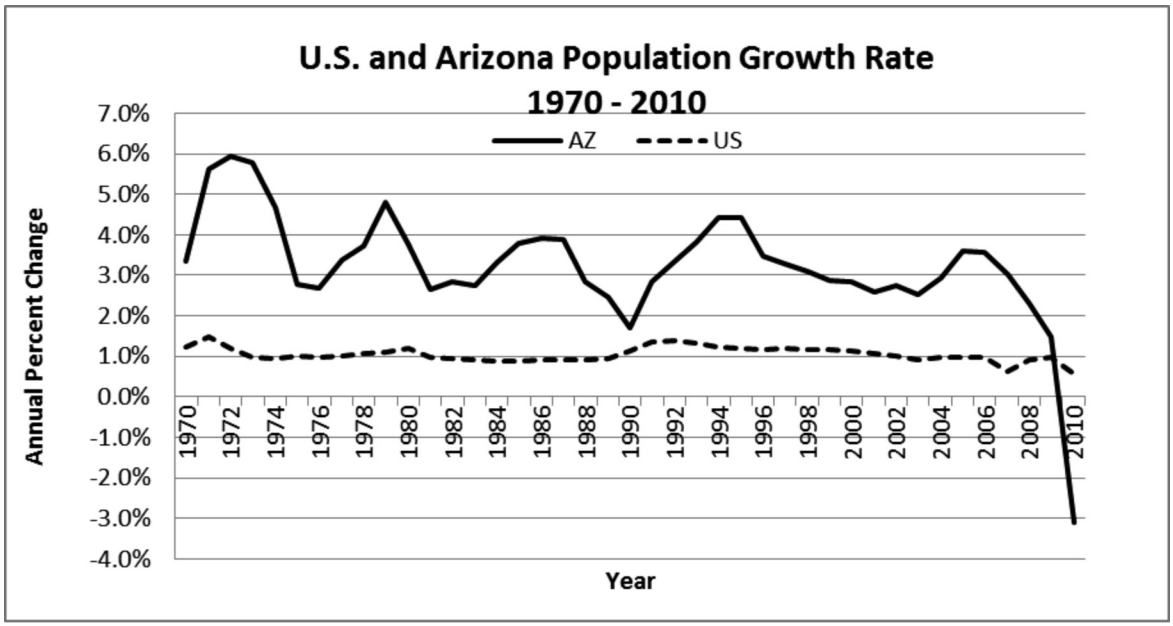
* Indicates 2009
Source: National Agricultural Statistics Service.

Figure 1. Arizona Has Grown Rapidly



Source: U.S. Census Bureau

Figure 2. Arizona's Growth Rate is Cyclical and Slowing

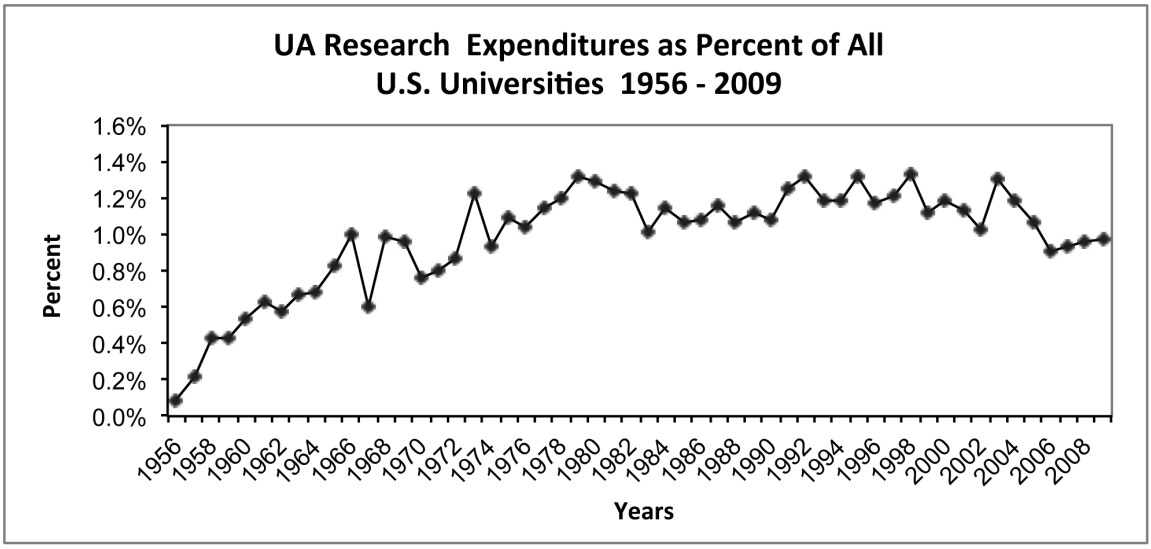


Source: U.S. Census Bureau

University of Arizona

The National Science Foundation annually summarizes how much money each university spends as "R&D Expenditures." These are the grants and contracts from government agencies (state, federal and local), industry, and gifts. They are reported as "expended" rather than the original amount of the gift or award. Many universities aspire to be in the "top few", and the competition keeps increasing as a result. Thus it is hard to just retain your ranking. One way of measuring this ranking is the percentage received by each university compared to the amount received by all universities. It the trend is up, you are gaining on the other universities, if it is relatively flat, as in the UA case, you are working hard but holding your own (see Figure 3).

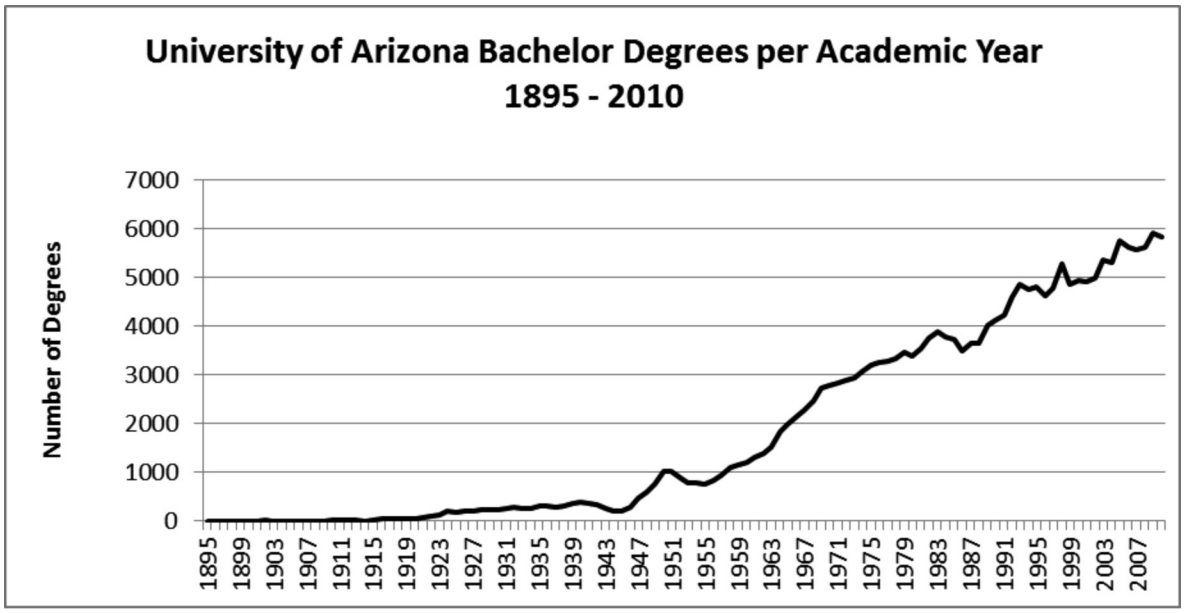
Figure 3. University of Arizona Research Effort.



Source: National Science Foundation and University of Arizona

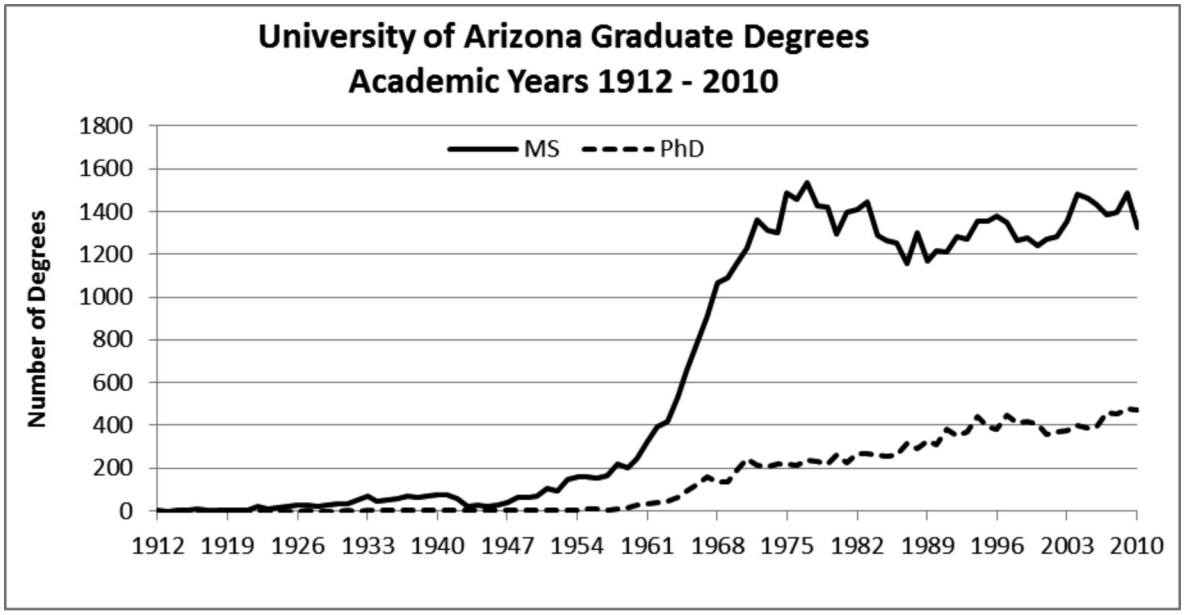
The UA degrees awarded give a graphic example of change. The number of bachelor's degrees is roughly parallel to the post-World War II population growth, and the dramatic rise in master's degrees reflects the impact of President Harvill's 1958 decision to expand the graduate program. Master's degrees grew rapidly and reached a leveling in the early 1970s. Doctoral degrees took longer to begin the upturn but that growth continues (see Figures 4 and 5).

Figure 4. Bachelor's Degrees



Source: UA Office of Institutional Research and Planning Support

Figure 5. Master's Degrees and Doctorates



Source: UA Office of Institutional Research and Planning Support

Historic Context I
1885 to 1951

While there were many changes in this 60-plus year period, there were many similarities to colleges of agriculture everywhere. Agricultural product yields were increased, new crops were tested, and relevant information was disseminated. New departments were created, fundamental and practical research was performed and teaching approaches were generally unchanged.

Early History of the University of Arizona

The first administrative unit in the University was the Agricultural Experiment Station, and the College of Agriculture was the first academic unit (followed closely by the School of Mines). The University also included a Preparatory Department, the equivalent of a high school, as there were only two high schools in the state. While the University was formally established in 1885, the first employee was not hired until 1890, when Frank Gulley became director of the Agricultural Experiment Station. He was technically the second director, because Regent Selim Franklin was identified as the first director to finalize approval to establish the Agricultural Experiment Station.

The following year Gulley became the first Dean of Agriculture, three years before the University got its first president, Theodore Comstock. Gulley had hired Comstock as the Director of the School of Mines, and the two of them later became opposing candidates to be the first president. When Comstock became president, he fired Gulley. By 1915 the University had grown sufficiently that it underwent a major restructuring into the College of Agriculture; the College of Mines and Engineering; and the College of Letters, Arts, and Sciences (which became the College of Liberal Arts in 1939). In 1915 the Preparatory Department also was dropped, and the College of Agriculture got its own building (now known as the Forbes Building). Prior to 1915 there were no departments, just program areas, so 1915 represents the first large-scale reorganization of the University.

Early History of the College of Agriculture

In 1910, the early courses in botany, biology, and chemistry were not taught in the College. In 1914 botany included plant pathology, landscape gardening, grazing, and biology included the herbarium for plants, insects and human skeletons.

The first departments within the University were established in 1915, with six in the College: Animal Husbandry, Agricultural Chemistry, Agronomy, Horticulture, Plant Breeding and Home Economics. By then, Agricultural Extension had become a unit within the College, forming the basic structure of today - teaching, research, and extension. By 1920 there were three more departments, Dairy Husbandry, Poultry Husbandry and Entomology. Agricultural Chemistry had become Agricultural Chemistry and Soils. Agricultural Education was taught in the School of Education. By 1925 two more departments were added, Irrigation Engineering and Plant Pathology. By 1930, Irrigation Engineering had become Agricultural Engineering, and two new departments were formed, Range Ecology, and Agricultural and Home Economics Education.

Over the next 25 years, departmental jurisdictions continued to be fluid as the field of academic agriculture developed rapidly. By 1935 the Department of Home Economics had become a School of Home Economics, and by 1940 two more departments were created, Agricultural Economics and Rural Sociology, and Animal Pathology. Agricultural Economics had previously been taught in the Department of Economics in the newly renamed College of Liberal Arts. There were three name changes by 1940: Agricultural and Home Economics Education had become Agricultural Education (the Home Economics part moved to the School of Home Economics), Entomology became Entomology and Economic Zoology, and Range Ecology became Botany and Range Ecology (The Botany portion had previously been housed in the College of Liberal Arts).

The mix-and-match continued. By 1950, Agricultural Education had become Agricultural and Agricultural Extension Education, Entomology and Economic Zoology had gone back to Entomology, and Agricultural Economics and Rural Sociology became Agricultural Economics. By 1955, Dairy Husbandry and Poultry Husbandry became Dairy Science and Poultry Science, respectively, and Agronomy became Agronomy and Range Management. Agricultural and Agricultural Extension Education reverted to an earlier name, Agricultural and Home Economics Education. Botany and Range Ecology became simply Botany.

Historic Context II
1951 to 1980

The mid-point of the 20th century began a critical time for both Arizona and the UA. Under the direction of only two presidents, Richard Harvill and John Schaefer, the University changed its character, reputation, curriculum, research approach, and management methods. The 1970s were particularly difficult. The various fields of science changed faster than the College could accommodate. Additional changes that were external to the College impacted many clientele, such as new federal regulations and the arrival of the environmental era. When some changes were made by the College they were made too quickly and not easily accepted. This period was much different from anything earlier or since, and it took its toll on faculty and staff as well as College audiences in the state. This troubled period came to an end in 1980 with a change of College deans.

The Critical Role of University Leadership

Richard Harvill, an economist, became president of the UA in 1951. He had joined the University in 1934 as an assistant professor and taught at other universities during the summers (for many, it was too hot to stay in Arizona before evaporative cooling became widespread). During the WWII years, he was the manager of the Phoenix Office for the federal Office of Price Administration (OPA). The OPA set price controls on non-agricultural products and rationed consumer goods. In 1947 the Faculty Senate, at the request of President James McCormick, began a study of the "Future of the University." Harvill was elected by the faculty to represent the College of Business on this committee. He resigned from the committee after two years (it was a three year study) to become dean of the College of Liberal Arts, and two years later, in 1951, he was told (not asked) by the Board of Regents to assume the presidency of the University.

Richard Harvill was in a unique position. He was a respected and long-term faculty member, and he knew a lot of people in the Phoenix area. He had the support of the Board of Regents, and he had served on the first committee to assess the future of the University (completed in 1949). Harvill presided at a time when Arizona and the University were growing rapidly following WWII and the passage of the Servicemen's Readjustment Act of 1944 (GI Bill for student education). Departments could hire faculty, and deans could hire department heads without having to set up faculty search committees; there were no affirmative action rules. He believed Arizona was ready for its only university to have graduate education; in fact, it needed it to grow and prosper (Arizona State University was renamed in 1958 from Arizona State College). Thus, Harvill in 1958 hired six new department heads in the sciences and engineering to form strong doctoral programs: in Chemical Engineering (Don White), Chemistry (Henry Freiser), Civil Engineering (Gene Nordby), Mathematics (Harvey Cohn), Physics (Albert Weaver), and Psychology (Neil Bartlett). Gene Nordby of Civil Engineering later went to Colorado, and returned to the College in 1986 as Department Head of Agricultural Engineering.

Under Harvill's presidency, the following units were established: Institute of Atmospheric Physics (1954), Kitt Peak National Observatory (1958), Lunar and Planetary Laboratory (1960), Optical Sciences Center (1964), Office of Arid Lands Studies (1964), College of Medicine (1967), and the Office of Graduate Interdisciplinary Programs (1971). In addition, he brought in retired senior faculty from other universities to work with departments (for example, Carl Marvel in chemistry) and sought advice of other senior faculty – Lawrence Clark Powell from UCLA for library development and Ruben Gustafson, a chemist and former president of the University of Chicago. Gustafson was hired to help with university operations but also taught the first televised chemistry course in the early 1960s. The impact of these years on the number of undergraduate and graduate degrees are dramatic (see Figures 3 and 4). In 1969 Pima Community College opened and had a slight effect on the enrollment growth (see Figure 3).

John Schaefer, a chemist, followed Harvill as president from 1971 to 1982. Schaefer had been dean of the College of Liberal Arts for less than two years. He changed the incumbents and titles of most individuals in senior administration, including promoting Albert Weaver to Provost for Academic Affairs (later Executive Vice President) and creating the position of Vice President for Research (Richard Kassander). Two of the first things President Schaefer did was to eliminate classes and faculty and staff work hours on Saturday mornings (8-12 noon) as well as ending public traffic on the Mall – very popular moves that raised the morale of the entire campus. Schaefer continued the transition efforts begun by Harvill, by hiring deans, in all disciplines, that were leaders and visionaries. He strengthened

the promotion and tenure process for faculty and raised the quality requirements for hiring new faculty (including an interview with the president or executive vice president). When departmental faculty positions became available, he moved them into the president's office for reallocation to deans and department heads that made the case for quality programs.

In 1978 Schaefer moved the UA from the Western Athletic Conference (WAC) to the Pacific Athletic Conference (which changed from PAC-8 to PAC-10). This was done in concert with Arizona State University, as both ASU and UA were charter members of the WAC and both became charter members of the PAC-10. This was important for more than sports reasons, as people tend to associate the quality of a university with the company it keeps in sports. The PAC-8 included California (Berkeley), UCLA, Stanford, USC, Washington, Washington State, Oregon, and Oregon State). During his tenure as president, the UA hired its first Nobel Prize-winning professor Willis Lamb, in physics (1974).

Schaefer was also responsible for developing a number of specialized units, including the Center for Creative Photography (1975) and the Arizona Research Laboratories (1979). Schaefer changed the mindset of the UA into a "can do" institution and was driven by programs that had merit and were quality oriented.

Harvill was the longest-serving president at 20 years, and Schaefer was the second longest-serving at 11 years. Together they transformed the University, each bringing special strengths that matched the challenges of their times. Harvill, with his excellent external connections and vision, was able to synchronize changes at the University to take advantage of the changes occurring in Arizona and in graduate education elsewhere. Schaefer, building on the strong academic base Harvill had created, strengthened the quality of the faculty and the reputation of the University. Harvill and Schaefer are the only two UA presidents selected from within the faculty, and both had been Dean of the College of Liberal Arts for about two years.

Rapid Transition Period Takes Its Toll on the College

Harold Myers

In 1956, Harold Myers, an agronomist, microbiologist, and soil scientist, became dean of the College of Agriculture. Dean Myers was known for his quick physical movements. When being introduced for a speech, he would sprint to the podium, talk, and return, at a sprint, to his chair. He was also known to pop into a faculty member's office unexpectedly late Saturday morning "to say hello" (while faculty and staff still had Saturday work hours). He followed the common UA practice at that time of allowing department heads to pick their faculty and to do most of the planning. He was from Iowa State University and hired a lot of people from Iowa State – the Director of Resident Instruction (now Academic Programs) and the Director of the Experiment Station had both been administrators at Iowa State. Rumor has it that he hired so many faculty from Iowa State that President Harvill had to tell him to halt the practice.

Myers remained in close contact with the agricultural industry and made special efforts to have the College represented at appropriate meetings around the state. This was his way of keeping aware of agricultural issues as well as creating visibility for the College throughout the state. He was a good delegator and much of the daily operation of the College was handled through the three directors of Resident Instruction, the Agricultural Experiment Station, and Cooperative Extension. As early indicators of environmental issues became evident, Myers set up appropriate committees to identify how the College should respond. Then as now, the appropriate response was one that would be both effective and practical. The problem was that these issues were new, and in many cases the appropriate response was not immediately obvious – neither for the faculty nor the agricultural audiences. Myers did something else, somewhat unexpected by those who may remember him. In 1959 he hired the first molecular biologist in the College, Albert Siegel, based on external recommendations from the California Institute of Technology for improving efforts in the UA plant science areas. This was just after President Harvill began his efforts to raise the research activities at the University. The Myers motto was reportedly "evolution not revolution." In some areas he was a bit revolutionary, but there was also a lot of the "evolutionary" approach, and the College had been accused by some (inside and outside of the University) of not keeping up with the times. There were other departments in the UA that could be described this way too, but they were not subject to as much state-wide visibility. President Schaefer began to increase the quality in all departments and this process was a big factor in changing the university as a whole, as well the College.

The 1970s were unique for the country as well as the UA, and especially for the College:

- The U.S. Environmental Protection Agency (EPA) was formed in 1970, and the National Environmental Policy Act (1969) began to require Environmental Impact Statements,
- Arizona banned the use of the pesticide DDT in 1970 (because of milk contamination) and the EPA banned it in 1972,
- The bar code was developed, and the first spreadsheet (VisiCalc) was available on the Apple II computer,
- The Western Sagebrush Rebellion began in 1976 (western opposition to federal land, water and mineral use regulations),
- OPEC (Organization of Oil Exporting Countries) imposed two oil embargoes: 1973 and 1978,
- A new UA president took office in 1971 as President Richard Harvill retired after 20 years, and
- A new College dean took office in 1973 as Dean Harold Myers retired after 17 years.

Taken together, these changes made a huge difference in how the College set its priorities and was managed.


Gerald Stairs

In 1973 Dean Gerald Stairs, a forester, replaced Dean Myers. Stairs had a much different approach from Myers and made some significant changes to the College. Some of these changes were due to information developed by President Schaefer, who had requested advice from two senior administrators of other colleges of agriculture before the dean's search was underway. These suggestions noted the College was quite traditional and focused on agriculture. It also needed more integration of extension with instruction and research and a greater focus on urban areas and biological sciences. Finally, it was suggested that there could be some departmental mergers, including bringing natural resource programs together and a name change for the College.

Stairs was less of a delegator than Myers and immediately transferred titles of Director for Extension and Director of Experiment Station to himself, making the incumbent in those positions into an associate director. In 1974, Stairs established, in accordance with what Schaefer's consultants had suggested, the School of Renewable Natural Resources. The School was compiled from the Department of Watershed Management and from several units in the Department of Biological Sciences in the College of Liberal Arts. He also formed the Department of Plant Sciences from the departments of Agronomy and Plant Genetics, Horticulture and Landscape Architecture (moving Landscape Architecture to the School of Renewable Natural Resources). The Department of Soils, Water and Engineering was put together from the Departments of Agricultural Engineering, and Agricultural Chemistry and Soils. The changes that Stairs made in College direction and organization, along with personal style and interactions with various clientele groups led to strained relations with many in the agricultural community.

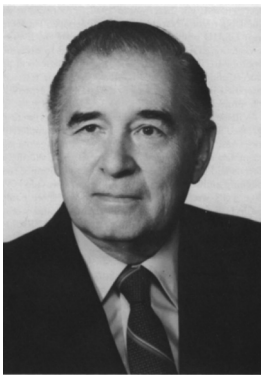
In 1973 Stairs began the first college-wide planning effort by having a large number of faculty (79) involved in a comprehensive study of all programs. That effort was chaired by Edward Nigh, Head of the Department of Plant Pathology and Chair of the Dean's Advisory Council. Its purpose was to recommend specific priorities and administrative changes. It was completed in 1975, but it was never acted on for reasons that are unclear. In 1974 Dean Stairs established the Council for Environmental Studies immediately after receiving a recommendation to do so from the College Environmental Quality Committee. That committee was appointed by Dean Myers and looked for ways to improve how the College addressed the increasing environmental concerns that developed in the 1970s.

Dean Stairs resigned effective December 1977 under some pressure from client groups, some unrest within the faculty and administrators in the College, and concerns in the President's Office.

Leaders as Too Far Behind or Too Far Ahead

There were more changes in College department names and organization and in management methods during the 1970s than in any other time period. It was also a decade of significant change occurring in the country and among various College audiences. It is not unreasonable to say that the College was faced with making major adjustments because it had waited too long to make small adjustments. And then, when the College did act, it did so without involving other affected parties. Regarding changes in the College, many felt that the 1970s were a time of too much too fast, and in some cases there was too much change.

Stabilizing:
Adapting to a New Era 1980-1987


Darrel Metcalfe

The year 1980 begins the 30-year period which is the focus of this history. It covers three Deans: Darrel Metcalfe, Bart Cardon, and Gene Sander. It includes the establishment of the Arizona Meteorological Network and the selling of the Phoenix area experimental farms, to be replaced by the Maricopa Agricultural Center. It highlights the two major innovations that had a dramatic impact on the College's growth: 1) molecular biology (begun in the College in the late 1950s and accelerated in the 1980s), and 2) the appearance and implementation of new communication technologies. The latter includes both information technology (which impacted teaching, research, administration, and extension) and agricultural technology (automation, sensors and other aspects of precision farming).

After Dean Stairs left, the Director of Resident Instruction, Darrel Metcalfe, was asked to serve as Acting Dean for one year and then became Dean for almost two years. During this period several searches for a new College dean proved unsuccessful. While reasons for these failures vary by whom is asked, the most common explanations identify candidates' concerns about the role of two agriculture-related units at the University that were not within the College (the candidates felt they should be) and the efforts required to repair relationships between the College and its multiple audiences as well as with faculty and staff. Metcalfe had a difficult job, given all the pieces that were in flux. However, he managed to maintain a functioning college and even began some new traditions. The First Annual Ag Alumni Breakfast was held at Homecoming, November 1980. The problem of finding a dean was finally resolved by some informal suggestions to President Schaefer that Bartley Cardon be the next Dean.


Bart Cardon

After several meetings with the President, Cardon agreed to become Dean on December 1, 1980, four months after he retired as Chairman of the Board of Arizona Feeds. Cardon had a unique career and character which turned out to be well fitted for what the College needed at this time.

He had a master's degree from the UA in Soil Microbiology and a doctorate in Biochemistry and Microbiology from the University of California, Berkeley. While still a graduate student at Berkeley he was called up for World War II active duty. During the war he rose to the rank of lieutenant colonel and served as a group commander and a group operations officer under General Patton. After the war he returned to Berkeley, wrote the theses to complete his doctorate in 1946, and was invited by the President of the UA to join the UA as an Assistant Professor of Animal Husbandry (now Animal Science). When back in Tucson he started the first Armored Reserve Unit in Tucson and was the battalion commander as a full Colonel. He left the University in 1954 as a tenured full professor to be Research Director for the Arizona Milling Company, which eventually became Arizona Feeds. In the intervening years, he was heavily involved with the 4-H Program and was one of the initial board members of the 4-H Foundation. He was active in a number of agricultural professional organizations and knew several members of the Board of Regents and College faculty. He was well-known throughout the state, especially in agricultural circles. He served on Governor Bruce Babbitt's Groundwater Study Commission as a representative of agriculture. That commission had representatives of groups involved with water, and it prepared the legislation for the Groundwater Act of 1980.

Shortly after Cardon's arrival, in 1982, Henry Koffler succeeded John Schaefer as President of the University, and Cardon gave him a special tour of Arizona. Koffler was a microbiologist and biochemist and was experienced in working in interdisciplinary settings. He also was the only UA president to receive a Bachelor's Degree from the UA (in Agricultural Chemistry and Soils). He became president just as significant changes were taking place in the biological sciences and information technology. Koffler focused on a number of areas but in particular he thought the biological sciences needed a greater emphasis. Koffler also appointed a Task Force on Information Services, which reported in 1984, and included outside consultants as well faculty and staff. Koffler also had the cabinet develop about a half dozen major white papers. Subsequently, there was a major reorganization of all central computing and communications organizations and new hardware and software purchased to modernize these functions. These efforts included a large expansion in the use of personal computers and electronic mail on campus. Both of these emphasis areas were timely and again two leaders were in sync with the changing environment.

Cardon reestablished good relations with the agricultural community and within the College, but he also worked with other disciplines to bring the College in line with modern management processes and developed a relevant programmatic focus for the changing times. He encouraged the use of the new technology called personal computers, and in 1982 he began the first unit-specific long-range planning process for the College. After seven years as dean, at age 72, Cardon retired and began working with the UA Foundation. Upon retirement Cardon also founded the Ag100 Council – which began as a fundraising group – each member giving $100 per year. Today the Council continues the "giving" but also serves as a "sounding board" for important issues relating to Arizona agriculture.

Cardon had a commanding presence. A friend (and former member of the Arizona Board of Regents) once remarked that "he had a voice that could be heard as far as Bisbee." He had been born on a Tucson farm (in the community of Binghamton) at the corner of Country Club and Prince Road. The silo from his farm still stands near the corner and is now an apartment house. In addition to the farm on the south side of the Rillito River, the family had a ranch on the north side of the river. The grazing area for the ranch was roughly from Oracle Road on the west to Redington Pass at the east end of the Catalina Mountains and from the Rillito River north to the base of the Catalina Mountains. He had camped and ridden all over the foothills. Since the UA ROTC was a Cavalry unit at that time, Cardon later remarked that he did especially well in horsemanship. He was also the Cadet Colonel when he graduated.

There are some similarities in Cardon's role as Dean and Richard Harvill's role as president. Like Harvill, Cardon had a long history with the UA, knew many people in the state (especially the agricultural community), had the full respect of the faculty, and had the future of the College (and the UA) topmost in his mind. This is what was needed to get all parts of the College and its audiences pulling in the same direction.

In 1978 the Arizona Board of Regents appointed an Agricultural Advisory Committee to evaluate the need and use of research farms, with directions to look specifically at urban area farms:, Mesa Farm, Salt River Citrus Station, and Cotton Research Center in Phoenix and the River Road Farm (Dodge and River Road); and the Casa Grande Highway Farm in Tucson. The committee reported a year later that the listed farms were to be sold, with the proceeds used to purchase a new facility. In 1983 the Maricopa Agricultural Center was established on a farm previously owned by Fred Enke, Jr. The property is about 25 miles northwest of Casa Grande, near the town of Maricopa. The committee had not initially looked for something in this location or of this size, but Enke was interested in getting out of the farming business and approached the University. Enke's father had been Coach Fred Enke of the UA baseball team for 36 years. The new site was named the Maricopa Agricultural Center and was divided into two areas: an experimental farm and a demonstration farm (a total of 2100 acres).

The main building was named the Bartely P. Cardon Research Building in October 1987, just after Cardon retired as Dean, and houses administrative offices, research laboratories, and meeting rooms. In addition to the Cardon Research building and experimental fields (laser leveled and soil mapped), MAC has eight single or double dormitories, wells and special facilities for irrigation experiments, a cotton gin, a weather station (AZMET), green houses, fish production, and an air strip. Cooperative Agreements allow several USDA facilities or industry experiments to be located at MAC. There are also educational facilities for youth through the Ag-Ventures and 4-H programs.

Refocusing:
Growing Under New Conditions 1987-1997


Gene Sander

This period covers roughly the first half of Gene Sander's role as Dean. It was a time of increasing urbanization which impacted students and faculty as well as College audiences. These groups were also impacted by the changing emphases on the part of federal funding agencies and the maturing of the new technologies which had been introduced by personal computers. There was also the promise of the Internet, which was in its early years.

President Henry Koffler hired Eugene Sander as the new College dean in 1987. Sander arrived at a critical time, where his background and experience became crucial to managing the changes that were taking place on campus. Research in molecular biology for agriculture (biotechnology is the term for the applied aspects) had begun in the College in the early 1960s and was a growing field. Koffler was a biological scientist and he encouraged interaction across the entire campus to meet the interdisciplinary needs of the biological sciences. Koffler also established three University-wide departments. These were jointly administered by a group of three deans (Agriculture, Medicine, and Science), so Sander's knowledge of medical school management became quite useful. The three departments were: Biochemistry (since moved to a department and then merged with the Department of Chemistry to become the Department of Chemistry and Biochemistry), Microbiology and Immunology (the microbiology portion moved to the College and the immunology portion remained in the College of Medicine), and Molecular and Cellular Biology (continued as a department in the College of Science).

Sander's long experience in medical schools and in both the research and applied aspects of the agricultural and biological sciences brought essential expertise to the campus and the College. He was also skilled in working with other colleges, particularly medicine. Bart Cardon introduced Sander to the Arizona agricultural community early on, and this was an immense help in getting established as a new dean. He quickly became familiar with the agricultural situation and the statewide offices and experimental farms of the College. As dean, he acquired a reputation for raising the questions with the UA administration that needed to be discussed.

Sander received his master's degree in animal nutrition (with minors in biochemistry and physiology) from Cornell University in 1959 and then then joined the U.S. Air Force. He left as a captain in 1962, as assistant chief of the Biospecialties Section, Aerospace Medical Research Labs, Wright Patterson Air Force Base, Ohio. He returned to graduate school and received a Doctorate in biochemistry from Cornell in 1965, followed by a two-year postdoctoral fellowship at Brandeis University.

Sander began his academic career by joining the faculty at the University of Florida, College of Medicine, as an Assistant Professor of Biochemistry. After serving as associate departmental chair he left to become chair of the Department of Biochemistry at the West Virginia University Medical Center, followed by head of the Department of Biochemistry and Biophysics at Texas A&M University. After serving as department head for seven years, he became Deputy Chancellor for Biotechnology Development for the Texas A&M University System and Director of the Institute of Biosciences and Technology at Texas A&M University.

Sander was raised on a Minnesota farm, where his father was a Cooperative Extension County Agent. He had been a 4-H member as a child. He has been president of the Glyndon Farms Company in Minnesota since 1999 and previously was vice president from 1986 to 1998. He has served on the board of directors of the Arizona Farm Bureau since 1987, and the Arizona-Mexico Commission since 1993. He is also on the board of directors for the Arizona Seed Trade Association, and a member or chair of a number of University-related national committees and councils.

Sander was responsible for a number of firsts for the College:

- Established the annual new faculty tour, where faculty (and guests) tour the state in a large bus to learn about Arizona and its agriculture as well as to meet people associated with College activities.
- Encouraged staff and faculty councils and began newsletters to improve communication and feedback opportunities within the College.
- Increased the types and number of awards the College gives to both faculty and staff and to those in the state that should be recognized for their contributions to agriculture and the College.
- Substantially increased endowments and financial contributions to the College.
- Provided an overall framework, by hiring high quality faculty and administrators, that increased departmental rankings, research funding, and significant endowments.

The College transition underway in the 1970s and 1980s was similar to what the UA had gone through in the 1960s and 1970s, where the institution changed from primarily an undergraduate regional university to one with a research focus and to a nationally recognized and competitive university. This took two presidents. Harvill was able to set the stage by expanding the UA's academic base, partly because he was well respected in the state and the University. Schaefer followed, taking the expanded base and not only effectively sustaining the changed University but carrying it to new heights by careful management and attention to quality and need. Similarly, Cardon stabilized the College, continued its movement into new subject areas and re-established good relations in and out of the College, so external support returned. Sander then took the College to new levels and modernized its structure and functions. Both Cardon and Sander also had significant familiarity and experience with current and emerging management methods.

In the late 1980s the enrollment in College majors started going down, and the curriculum was changed at the request of some faculty and some in the private sector; those hiring our graduates wanted science, but also creativity and management skills. The faculty wanted better student quality. The College responded by raising the requirements for chemistry, biology and math to equal those required of regular science majors.

Shortly after Sander's arrival, he appointed a Committee on Potential College Reorganization. The committee consulted previous related studies and the members were all experienced administrators. Several options were developed that covered the range of activities under College control and some changes were made in how the College was administrated. Sander arrived at a time when the UA was being asked by the Arizona Board of Regents to prepare strategic plans with more focus. He took planning seriously and developed a process that involved members of the college as well as College clients and others.

When President Manuel Pacheco arrived in 1991, he became interested in a large-scale assessment effort (PAIP – Project for the Assessment of Institutional Priorities) and started the quality management program (CORe – Continuous Organizational Renewal). However, the College already had a Quality Guidance Council, and it was easy to work with the new president on his interests. As part of these processes, Sander streamlined the College planning products and made them into productive management tools rather than just something that we were required to do, and integrated them with annual budget planning sessions.

Sander also put on more miles per year than any other Dean of the College. Every several years he would make the rounds of the state to visit all county Cooperative Extension offices. He attended a number of Arizona agricultural industry meetings and was often at meetings of the Board of Regents, in addition to attending a broad range of national meetings. But all of these meetings and planning thoughts paid off as the College continued its long history of getting its reports in on time, balanced its budget each year, and focused on all of its major audiences – students, research activities, and college clientele.

In 2007 Sander also served as the UA Executive Vice President and Provost, taking a leave of absence from the College for one year. During that year Vice Dean Colin Kaltenbach became Dean, with Associate Dean David Cox becoming Vice Dean. In 2008 Sander returned to his dean position. In 2005, Sander became the longest-serving dean of the College, serving under four University presidents. When he retires in 2011, he will have been dean for 24 years.

Sustaining:
Preparing for an Uncertain Future 1997-2010

During the last 15 or so years there has been more uncertainty in funding, a greater interest in interdisciplinary activities, and an increased acquisition of new buildings that have impacted how CALS reacted to changes in the external environment and to the rest of the UA campus activities. In addition there were changes in the fields of science, new practical problems in Arizona, and changing audiences for our products. We also had a student population that became more urban and less agricultural, and the technologies available to us for teaching, research, and extension exploded. To address these changes, and to ensure sustainability of the organization, the College became more successful at developing effective strategic plans. These plans involve appropriate program assessments and use a planning process that involved faculty, staff, and clients. These strategic initiatives are preparing the College to better navigate the future.

Organizational Shifts

The Overall College of Agriculture

The College has changed continually over the years, with accelerated changes when new deans or department heads were hired. However, the three principle areas have always remained at the heart of any reorganization: teaching, research, and extension. In 1995 the College tried to change its name from "Agriculture" to "Agriculture and Life Sciences." Several colleges of agriculture had already made this shift, which emphasized the increasing breadth of their academic mission. Faculty, staff, and the College clientele approved the change, and after some additional information, the Provost approved it. However, it failed when the required approval from the Faculty Senate was sought. Another attempt was made in 2000, and it proved successful.

There are also some free-standing units that report to the College, principally the Water Resources Research Center (WRRC) and the Office of International Programs. The WRRC was formed in 1954 as the Institute of Water Utilization and was within the College. It was renamed to WRRC in 1964 as a result of the Federal Water Resources Research Act of 1964 and moved out of the College to become a university administrative unit. Over the years it reported to various colleges or departments. It initially focused on irrigation issues, but now as a research grant review agency it deals with a variety of technical and policy issues.

The Office of Arid Lands Studies was established in 1964 and came into the College in 1981 as a free-standing unit. It was merged into the School of Natural Resources and the Environment in 2009.

While the Environmental Research Laboratory (ERL) was not free standing in the College, it was a separate unit in the university when founded in 1967 and located at the Tucson International Airport. ERL grew out of the Solar Energy Research Laboratory (1957) that was in the Institute for Atmospheric Physics. In 1995 the ERL came into the College as a unit within the Department of Soil, Water and Environmental Science.

The first international project began in 1952 when the College collaborated with the U.S. Department of State and the USDA in the development of the Agricultural College of Iraq. This was a seven-year project, and the multi-base palm tree just to the northeast of Old Main is a 1955 gift from the Iraqi students to the UA.

International scholars and collaboration projects were increasingly part of the College through the 1970s, so the College established the International Agriculture Programs Office in 1977 with Professor Gerald Matlock as the full-time coordinator. In the early 1980s Professor John Maré became director of the College Office of International Programs, which was also charged with all Peace Corps activities on campus. This is still the case today. In 1986 Professor Jimmye Hillman became the director of the office, and it was transformed into the campus-wide Office of International Programs. A couple of years later, it returned to the College with Bodo Bartocha as director, and in 1995 Kennith Foster replaced him, while continuing as director of the Office of Arid Lands Studies. When Foster retired in 2004, Colin

Kaltenbach became director of the office. During this time, the longest and largest project took place in Brazil, from 1963 to 1973, where its mission was to strengthen the integration of agriculture, research, education, and extension capacity at the federal University of Ceara.

In 1990, the U.S. Congress authorized the International Arid Lands Consortium, with managing director Jim Chamie, to be located at the College. The nine-member consortium includes six universities and its vision is be acknowledged as the leading international organization supporting ecological sustainability of arid and semiarid lands. Although it operates worldwide, the focus in the Middle East.

The Consortium for International Development was established in 1972 by 11 western region universities and the University of Hawaii and managed by the College. It was terminated in 2002, however, when international activities declined. The peak of international activity was in the mid-1980s, but then it slowed as the U.S. Agency for International Development funding waned, general UA interest declined, and faculty became less willing to be involved on-site in other countries.

Accommodating Changes in Science and Technology

There were two major developments in the fields of science and technology that changed the course of how the College went about its business: information technology (particularly personal computers) and molecular biology and its associated devices.

Molecular biology began as a new science in the 1930s, but it was not until the early 1960s when it became mainstream, following the structural determination of DNA in 1953. The College was among the first at the University to engage in this field. Professors Albert Siegel and Milton Zaitlin in the Department of Agricultural Biochemistry were the first two faculty in the College to use it. They were followed by Professor Frank Katterman in 1965 in the Department of Plant Breeding. The first department head with this area of expertise was William Bowers in the Department of Entomology, in 1984. This was the start of technologies with names like biotechnology and genetic engineering, and they brought new techniques and approaches to the field of genetics.

Personal computers became available in 1980, and the numbers in the College slowly increased until mid-1983, when there was a dramatic increase. This increase was due in part to the director of Cooperative Extension, Roy Rauschkolb, deciding to put computers in every county and in part to the University instituting a 50/50 matching program for academic departments. Before long, the College and a very large number of people were able to use the new computers for spreadsheets, word processing, and limited databases. They radically changed communication, teaching and management. The spreadsheet in its early days seemed like a miracle. The dean's office saved considerable time when they began using spreadsheets in budget preparation; a person could revise a number and see an immediate re-calculation. One could ask questions like "What if we increased salaries for everyone vs. selective increases based on merit pay?" – and get a quick answer.

Using Multiple Disciplines for Problem Solving

The College has long approached a problem from several disciplines. For example, is the cause of a poor performing plant due to the seed source, water, nutrition, pathogens or insects, weather, or something else? Working together produces better results when the problems are complex. The College has worked with other campus colleges, other universities, or external government agencies for a long time, but in the 1970s this need for cooperation increased, and it continues to increase.

For example, the UA has also been involved in interdisciplinary activities, including a provision for obtaining graduate degrees by combining the expertise of several departments (Graduate Interdisciplinary Programs), beginning in 1964. Or, through establishment of the Arizona Research Laboratories in 1979, where collaborative research on new or emerging subjects is done. More recently the BIO5 Institute for Collaborative Research, created in 2001, addresses five disciplines: Basic Agriculture, Basic Science, Engineering, Medicine, and Pharmacy. The Institute has a separate building for research and teaching but many university departments are involved while working in their own part of the campus. Within the College there are 8 departments involved in BIO5, nine departments in GIDP programs, and 8 departments in the Institute of the Environment (formed in 2008). In addition, there is strong cooperation with the Agricultural Experiment Stations and Cooperative Extension programs with other land-grant universities.

Academic Programs

In early days this area was called resident instruction to distinguish it from off-campus extension instruction. The academic departments and all interactions with students fall within this unit. In 1996 David Cox became associate dean and director of academic programs. In the past ten years, there has been an increase in the percentages of women, minorities, undergraduates, residents, and full-time students. The names and functions of academic departments have changed and become fewer in number (see Table 2).

Table 2. Comparison of Departments and Schools Over a 60-Year Period

Departments and Schools in 1950	Departments and Schools in 1980	Departments and Schools in 2010
Ag Chemistry and Soils	Ag Economics	Ag and Biosystems Engineering
Ag Economics	Ag Education	Ag and Resource Economics
Ag Education	Animal Sciences	Ag Education
Ag Engineering	Home Economics (School)	Animal Sciences
Agronomy	Nutrition and Food Science	Entomology
Animal Husbandry	Office of Arid Lands Studies	Family and Consumer Sciences (School)
Botany and Range Ecology	Plant Pathology	Natural Resources and the Environment (School)
Dairy Husbandry	Plant Sciences	Nutritional Sciences
Entomology and Economic Zoology	Renewable Natural Resources (School)	Plant Sciences (School)
Home Economics (School)	Soils, Water and Engineering	Soil, Water and Environmental Sciences
Horticulture	Veterinary Sciences	Veterinary Sciences and Microbiology
Plant Breeding		
Plant Pathology		
Poultry Husbandry		

Cooperative Extension

In 1989 James Christenson became associate dean and director of Cooperative Extension and made some immediate and significant changes. He moved leadership for final hiring decisions of all county faculty to the director's office for more consistency and quality. He also required all new county faculty to have a master's degree or higher and to write grant applications.

Cooperative Extension in Arizona began in 1914 as Agricultural Extension; before that time, the transfer of agricultural information from the UA was through the Agricultural Experiment Station. "Cooperative Extension" is the more appropriate term, as the funding and management is a cooperative effort between the federal government, county government, and the UA. State law defines the composition and activities of the seven-member County Extension Advisory Boards that are appointed by the County Board of Supervisors. These boards review county extension office plans and budgets annually. In addition, the Arizona Board of Regents approves Cooperative Extension plans of work for the following year.

In the mid-1970s Dean Stairs moved the extension specialists from the Cooperative Extension offices (on- or off-campus) into the academic departments, to better connect extension with academic discoveries. In the mid-1990s when Dean Sander required that the Agricultural Centers have a resident director, some extension specialists were physically located at the research centers but still reported through the academic departments. There is an extension office in each of the 15 counties, and several counties have additional offices. Five Indian Reservations have extension offices, but extension serves all 21 reservations. Now extension specialists teach some campus courses, and some county agents have become area agents – covering more than one county on issues related to the agent's specialty.

The specific program emphasis areas within Cooperative Extension have changed over the years, based on needs at the time, clientele views and program assessments, but the four current categories represent the basic subjects over the years. Current program areas, including their initial focus when the College began, are the following:

- Agricultural and Natural Resources (initially as Agriculture),
- Family, Consumer and Health Sciences (initially as Home Economics),
- Community and Economic Development, and
- 4-H Youth Development (initially as 4-H).

Community and Economic Development was created from Rural Development, which was not an original program area but developed some years later.

In addition, there are many narrower topics, including fire prevention and control, geospatial activities (e.g., GPS), water use, biometeorology, climate sciences, role of grandparents raising children, and a variety of agriculture-specific areas. The big changes over the past 30 years have been the increase in youth participants, the decline of agriculture and the increase in environment and natural resources. There has also been a shift from rural to urban audiences. Organizational shifts have included the introduction of "area agents" who cover several

counties, fewer central administrators, and shifts to electronic information delivery.

Among the unique activities within Cooperative Extension is Project CENTRL (Center for Rural Leadership). It began in 1981 with funding from the Kellogg Foundation and in 1998 became a non-profit 501(c)(3) organization that partners with Cooperative Extension. The two-year program is intended for individuals already in leadership positions in towns and small cities across Arizona. It offers 12 seminars that provide leadership skills and networking opportunities for current and past participants (over 500 persons). Leadership skills are also provided to youth participants in the 4-H programs that are organized for each county.

Agricultural Experiment Station and Agricultural Centers

In 1989, Colin Kaltenbach became vice dean and director of the Agricultural Experiment Station, following the retirement of L.W. Pete Dewhirst. The experiment station has several functions in addition to operating the experimental farms. Most importantly, it is the administrative arm of all research activities in the College and manages the off-campus research centers and extension located around the state. It also provides information to the USDA National Institute of Food and Agriculture regarding the types of research underway in Arizona. Each land-grant university provides this information, and the compilation of results is easily compared on a state or national level. These activities allow easy sharing of information among the states and facilitate many cooperative projects that focus on specific research efforts.

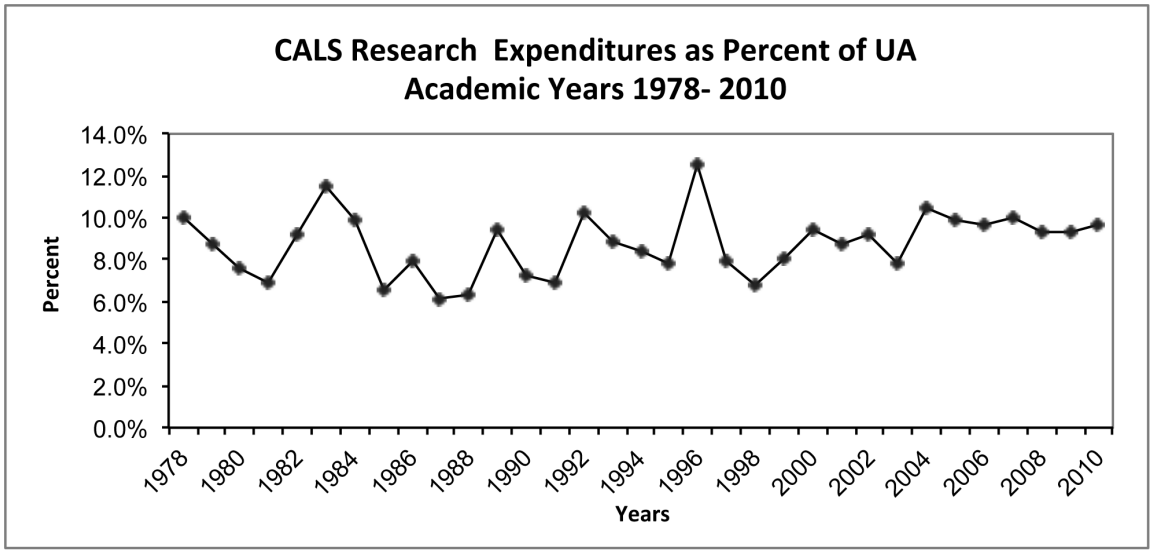
Overall research funding has slowly increased over the past 25 years from about 6% to about 10% of the total university research funding (see Figure 6). Research funding is defined as the amount of a grant, gift, or contract funds expended in a given year, regardless of the total amount or length of the grant. Grant and gift sources include the federal government (the greatest part), State of Arizona, Arizona counties and cities, foundations, and industry. The funds, over $58 million for fiscal year 2009-2010, are used primarily for research, but also include student services, extension, research, and instruction.

Grant and gift sources include the Federal Government (the greatest part), State of Arizona, Arizona Counties, and cities, foundations, and industry. Also included are contracts with other universities that involve our faculty in cooperative efforts.

In 1989 the “experiment stations” or “farms” were renamed “agricultural centers” to reflect the presence of both research and extension activities. In 2010 there are eight centers, each managed by a resident director:

- Campus Agricultural Center
- Maricopa Agricultural Center
- Red Rock Agricultural Center
- Safford Agricultural Center
- Santa Rita Experimental Range
- V Bar V Ranch
- West Campus Agricultural Center
- Yuma Agricultural Centers (two locations)

Figure 6. College Research Expenditures as a Percentage of UA Expenditures



Source: UA Office of Vice President for Research.
Note: Prior to 1978 data were collected by type of science rather than college and are not included.

Providing Recognition

Awards are handled by the Office of Development and Alumni Affairs. The current director, James Davis, took over in 2007, following Bryan Rowland (2002-2007), John Engen (1996-2002), David Shoup (1994), and Phil Upchurch (founding director 1981-1994).

The first award recommended by the College was an honorary doctorate in 1923 awarded by the UA. Providing awards to students has long been recognized as important, and there were a few faculty awards as early as the 1960s, such as Professor of the Year. By 2010 there were 33 types of awards made to nonemployees, although each award is not made each year. The number of awards given increased significantly in the 1970s and 1980s to about six per year, with another increase in the 1990s and 2000s to about 17 per year. In addition, there are a number of awards given to faculty, staff, and students in recognition of special service. By the 1990s it was well recognized that awards took their rightful place in the list of factors that improve morale and make the working environment a better place (see Table 3).

Table 3. Comparison of College Awards Over 60 Years

1950	1980	2010
Honorary Degree (UA)	Alumni Appreciation Award* Appreciation Award* Distinguished Citizen Award* Extensionist of the Year Honorary Alumnus* Honorary Bobcat* Honorary Degree (UA) Public Service Award*	CALS Alumni Achievement Award Alumni Association Centennial Achievement* Alumni Council Directors Award* Arizona Agriculturist of the Year** Carol Knowles Award for Excellence Distinguished Citizen Award* Early Achievement Award Extensionist of the Year Friend of Agriculture or Friend of CALS Heritage Family Award Honorary Alumnus* Honorary Degree (UA) Lifetime Award Outstanding Achiever Award Professional Achievement Award* Public Service Award* Sidney S. Wood Alumni Achievement Award* Young Achievers Award

*Alumni Association Award, ** Ag 100 Council Award
Honorary Degree – recommended by the College and approved and awarded by the UA

Development and Endowments

The College Development and Alumni Office began in 1988 by combining the Office of Development (1981) and the Office of Alumni Affairs. The latter began as a section of the Development Office. Phillip Upchurch was the director of all these units. The development efforts began with receiving money for specific purposes, and in 1986 the first endowed chair was funded, the Porterfield Chair in Plant Sciences. There are now 17 endowments of this type:

- Bartley P. Cardon Endowed Chair in Agribusiness and Policy (2005)
- Bart Cardon Associate Dean for Academic Programs (2006)
- Bud Antel Endowed Chair for Excellence in Agriculture and Life Sciences (#1) (2005)
- Bud Antel Endowed Chair for Excellence in Agriculture and Life Sciences (#2) (2005)
- C.W. and Modene Neely Endowed Professorship for Excellence (2007)
- Carl E. Weiler and Patricia Weiler Endowed Chair for Excellence (2004)
- Cecil H. Miller, Jr. and Cecil H. Miller, Sr. Families Chair of Excellence (2005)
- Fitch-Nesbitt Endowed Chair for Excellence in Family and Consumer Sciences (2004)
- John and Doris Norton Endowed Chair for Fathers, Parenting and Families (2008)
- Neely Family Endowed Professorship for Excellence in Agriculture and Life Sciences (2010)
- Phyllis and Roy Hislop Endowed Chair in Animal Sciences (2009)
- PETsMART Distinguished Professor of Practice (2008)
- PETsMART Endowed Professorship of Practice in Retailing and Consumer Sciences #1 (2004)
- PETsMART Endowed Professorship of Practice in Retailing and Consumer Sciences #2 (2004)
- Porterfield Endowed Chair in Plant Sciences (1986)
- Race Track Industry Program Endowed Chair (2005)
- Take Charge of America Endowed Chair in Norton School of Family and Consumer Sciences (2002)

Fundraising for buildings has also become important in recent years. The following College-related buildings were funded partly or fully by not using state or federal funding:

- Bio5 Institute (Keating Building)
- Marley Building
- Norton School of Family and Consumer Sciences at McClelland Park
- Meats Laboratory (Campus Agricultural Center)

Gifts and endowments have increased markedly for the college. From 1950 to 1980 there was only $564,000, from 1980 to 1987 there was $9 million, and from 1987 through 2010 over $153 million was received. These funds are used for a variety of purposes, including scholarships, endowed chairs, and specific projects or discretionary uses.

Managing and Communicating

The college does not run itself, and the difficulty in managing has grown as the college has become more complex, as state budgets change throughout the year and there is a trend that reductions are more frequent than increases.

Managing

Management styles of the deans and focus areas of the College have varied over time. For example, in the Dean Myers era of the 1960s, there was limited group discussion but plenty of one-on-one contact with administrators. It was a simpler time, and there were few focused subject areas in the College. In the time of Dean Stairs, in the early 1970s, there were many changes occurring in the world and the state, and more studies made and discussed. The executive committee for the dean was fairly large, including representatives from the two schools in the College as well as associate deans and others. When Cardon became dean, he immediately trimmed the size of the executive committee and made sure department head meetings started on time. (He only had to lock the door once at a scheduled meeting time for people to get the message!)

Dean Sander's executive committee consists of five people, the dean and four associate deans who represent administrative services, research, extension, and academic programs. Sander made another significant change to the department head meetings – every other meeting would be just the department heads with no deans or directors present.

Of course communication technologies have changed markedly in the last 20 years, and a great deal of management is now done electronically.

Working with Faculty and Staff

When Sander became dean he asked the senior faculty senator from the College, Malcolm Zwolinski, to be an informal adviser on faculty issues. In the early '90s this was formalized by creating a Faculty Council to advise the Dean, composed of all the elected faculty senators from the College. Similar advisory councils were set up for classified staff (Staff Council) and academic professionals (Appointed Professionals Council), the two non-faculty employee categories. Beginning in the 1960s the dean has held an annual meeting for all faculty and staff. While the format and purpose varies with the times or the style of the dean, the agenda typically includes an announcement of awards, a report on College activities and a question-and-answer session.

Complexity of Assessing Needs

The College and the College of Medicine are the two most complex colleges at the UA. The College is the product of the original land-grant concept, and therefore its activities and the assessment of those activities involves not only the University, but the state and federal governments and all the counties. All university academic departments undergo a review approximately every seven years. In the 1980s, the College departments were reviewed by the U.S. Department of Agriculture, and in the early 1990s the process was changed so that a USDA representative now joins the university review process along with external reviewers. In addition, the Agricultural Experiment Station and Cooperative Extension prepare a joint "Plan of Work" every five years, indicating planned programs and how they address issues relevant to the state. The Plan of Work includes feedback from various users of their services. Within the College, since 1995, each academic department head and the directors of the Agricultural Experiment Station, Cooperative Extension and The Office of Academic Programs meet with the Executive Council each spring to review the previous year's work, discuss future plans, and evaluate budget requests.

Finally, since the 1990s, all deans are reviewed every five years by a university committee, which takes into account input from college faculty and staff.

Planning

In the early days (pre-1965) planning was done informally and generally left in the hands of the department and unit heads. The Arizona Board of Regents published the first long-range plan in 1966, after requesting information from the universities in the previous year. In 1969 they updated that report. The Board of Regents' first detailed plan was in 1974 and included objectives for each campus. At the same time, Dean Stairs was the first College dean to do a comprehensive review of all college programs.

In late 1981 Dean Cardon received his requested long-range plans from the department heads. He had asked for both short- and long-term goals, with the appropriate assumptions and resource implications.

In 1983 Cardon announced the College needs to redirect our resources to meet the new challenges faced by the College. Based on the earlier departmental plan, long-range planning seminars and many discussions over the previous two years, Cardon provided a draft set of College priorities and objectives. The unit heads were to review these documents with their faculty and meet individually with the Executive Council. In 1984 an updated version of plans and priorities was developed, and following this, a two-year large scale study titled "Agriculture – Now and a Vision of the Future" was undertaken jointly for Dean Cardon and for Governor Bruce Babbitt. It was managed by Kennith Foster of the Office of Arid Lands Studies and completed in 1986. It focused on the perspectives of clientele groups. Also in 1986 a College Strategic Planning Committee produced a report on "Strategic Choices" which provided the first comprehensive review of driving forces of change relevant to the College and decision criteria for resource allocation. During 1986-87, based on new Arizona Board of Regents guidelines, Provost Nils Hasselmo requested planning information from the college deans, asking for mission definition and a few goals to address over the next 3-5 years. The College was prepared for the Provost's request. This began a more formal and continuing planning process in the College, which included specific college-wide focus areas and a greater emphasis on interdisciplinary activities, as well as a mechanism to track results.

The earlier planning periods resulted in up to 21 areas of emphasis as the College attempted to bring all programs into the strategic planning process. As planning became more sophisticated and people became more aware of changing conditions, the plans became more about direction-setting. In 1990 the College began preparing five-year strategic plans that addressed the mission and general goals, but also identified specific areas of focus.

In 1990 there were nine focus areas (listed alphabetically):

- Agricultural Production Systems Compatible with the Environment,
- Biological Research, Biotechnology and Their Applications,
- Diet, Human Nutrition, Health and Food Safety,
- Economics of Agriculture and Natural Resources,
- Environmental Planning and Design,
- Environmental Quality and Water,
- Family Well-Being and Lifelong Development,
- Multiple-Use Management and Conservation of Natural Resources, and
- Rural Resource Development.

By 2000 there were only six focus areas, with most departments involved in several of the focus areas. By 2010 the six areas had been redefined to adjust to changing times and were used as a "road map" of where the College is heading. The focus areas are also used to measure how much each department, Cooperative Extension, or Agricultural Centers are involved in each focus area for their extension, research, and teaching funding (this information is submitted annually for use at budget hearings). The 2010 focus areas are listed below (alphabetically):

- Animal Systems,
- Children, Youth, Families and Community,
- Consumers, Marketplace, Trade and Economics,
- Environment, Water, Land, Energy and Natural Resources,
- Human Nutrition, Health and Food Safety, and
- Plant, Insect, and Microbe Systems.

Communicating

The 1980s were a decade of significant change in communication methods and the College acted quickly. The Osborne I – a portable but heavy, computer that came with software became available in 1981, and the dean's office purchased five. These computers had a five inch monitor and two floppy disks. One of the 91K disks was for the program and the other for the final data storage. Their use was exclusively for financial assessments using the SuperCalc program (the first spreadsheet on personal computers, following VisiCalc on the Apple II computer). In 1983 Roy Rauschkolb, the new extension director, provided funding to install the newly-developed personal computers in every county. This came at the same time the University provided matching funds for personal computer purchases on campus. All departments in the College took advantage of the match so the whole College, as did much of the University, moved to the new technology quickly.

The electronic mail system at the time was FIDO, a bulletin board system that would allow everyone to send in their e-mail to one place, and then at midnight FIDO would send the messages to the intended recipients. FIDO is still used for the AZMET, the college-run Arizona Meteorological Network, but electronic mail has been greatly improved.

The College has had several public-oriented periodicals, beginning with the Agricultural Experiment Station Technical Bulletin (December 1890). A more popular title is Progressive Agriculture (began in 1949) and targeted to a general audience; it became Arizona Land and People in 1982. An alumni targeted publication was Agri-News (began in 1982) and became the CALS Compendium in 2008. In addition, there are many Cooperative Extension publications on a range of topics and variety of formats over the years.

In 1987 the UA purchased a computer conferencing system (CoSy) that allowed anyone to send electronic mail directly to others on the system. This was before electronic mail services were available for most people at the University, and those who did use electronic mail used different systems, preventing efficient communication campus-wide. But CoSy (for Conferencing System) also provided conferencing so groups of people could be in on a specific discussion. Examples of discussion groups include a business manager's forum, an equipment sharing program, a communications team, and The Coop (the old Student Union had "The Coop" where students could drop in for food and conversation – CoSy provided a similar light-hearted, on-line, general discussion area). It was also a tool for asking questions about the University. This was not instantaneous, like much of today's conferencing, but it allowed people from all kinds of disciplines around the campus to communicate easily. It had a major impact on the university culture, including extension offices around the state.

In 1990, Roy Rauschkolb required satellite receivers to be installed in each county office. This was a less successful endeavor – there were reception problems, equipment alignment was difficult, and there were limited programs available. Today none of the satellites are functioning, although some can still be seen. Other communications methods, primarily the Web, took over the function.

In 1992, when the first Internet hypertext-like program became available, the College began using it to share information of all types. But Gopher (developed by the University of Minnesota and named after its mascot) was short-lived and soon replaced by a much more capable true hypertext information handling program – the Web. In 1993 the College website became known as AgInfo. Shortly after that the University began their Web service and called it UAInfo. While these websites made great strides at the time in offering communication opportunities, initially there were too few people with adequate computer access for the sites to be widely used. Today websites are essential for any institution and are far more sophisticated. They handle a major workload for the College by making a wide range of information available in real time. The sites are organized so that anyone can find what is needed, easily and effectively. The Web has revolutionized how the College teaches, conducts research, and provides extension services. It has brought the on-campus and off-campus faculty and staff together. Today, a citizen or an extension agent can take a picture of a field situation, email the picture to a specialist or laboratory for review, and potentially have an answer shortly rather than the days required to mail or drive the specimen to the expert.

In 2000 the College implemented its eCommerce-capable website for selling products and publications. It is called CALSmart and was the first such site at the UA. This process facilitates on-line ordering and is particularly helpful for 4-H leaders because of the large variety of publications and the number of new 4-H members each year. In addition, the process is used for sending registration fees for college-sponsored conferences. Orders can be mailed or picked up at the CALSmart office at the Campus Agricultural Center. In 2002 the College began CALS NewsLine, a monthly electronic mail alerting service, for activities and newly released publications.

Beginning in 1989 the College used paper copy newsletters for giving general information to faculty and staff. These included general information and requests for feedback. Since 2000 the electronic CALS Weekly Bulletin has been sent to every employee once a week, and any employee can submit information to be included. The director of Cooperative Extension, Jim Christenson, since 1999 has sent a weekly email, Tuesday Morning Notes, to all extension faculty and staff. Since January 2009 the associate dean for academic programs, David Cox, has sent a weekly email, Monday Message Newsletter, to all students majoring in the College. The Development and Alumni Office has published "Compendium" (formerly Agri-News) semiannually since 2008. Of course, some of the traditional communications methods are still relevant, including meetings in the office or the field, radio and television spots, and newspaper articles.

In addition to electronic communications, some departments and many extension offices continue to provide paper copy newsletters or reports.

Looking Backward 60 Years

We can learn a lot from the past 30 years. There were only three deans but a tremendous amount of change in the types of audiences, the types of science, the technologies available for teaching and research, and the focus areas of specific departments.

In the previous 30 years, from 1950 to 1980, another tremendous amount of change occurred, moving the College from its strongly agricultural emphasis serving a small-population state to an international institution serving a larger and more diversified economy through its multiple areas of emphasis. One clear message is that we not only need to live with change, but understand the dynamics behind the change.

Some changes are so common that we don't think of them as changes:

- College audiences change,
- External world changes (e.g., science and technology, demographics, social norms, economy, resources),
- Faculty, staff and students change,
- Presidents and deans matter, and
- Infrastructure changes (e.g., schools and departments, facilities, communication)

Ten areas of most significant historic changes include:

- Communication technologies,
- Emphasis on molecular biology in addition to field-oriented agriculture,
- Increase in female students to almost 70% in recent years,
- Increase in minority students from 20% to over 30% in ten years,
- Increased emphasis on consumers, markets, nutrition,
- Increased emphasis on environment and natural resources,
- Methods of student learning and class participation,
- Movement from mostly production agriculture to genetics-based molecular approaches,
- Movement to more interdisciplinary approaches in all aspects, and
- Students and faculty with less farming and ranching experience.

Ways of learning have also changed – for students, faculty, and others. In the 1950s we used chalk and blackboard, and field trips or demonstrations as primary teaching methods. In the 1980s that changed to pens and whiteboards, slide or overhead projectors, and photocopied handouts. In 2010, we use computers and internet, and increasingly portable devices like cell phones or tablet computers. We are also less involved in "teaching" that is directed at students and more involved in "providing learning opportunities" by using a variety of methods to actively involve students in the process. It is probably safe to say we are in a revolution of how learning occurs.

There is one thing that was unique in the last 60 years. In 1950 the UA was a regional and teaching-oriented institution, where the state employment was still largely agriculture and mining. In 2010, the UA is a major research institution with national and international recognition. Arizona has a much larger population and the employment is more diverse. Thus the characteristics for both the state and the institution have gone through a significant transformation. This type of change will not be repeated. But, we could consider some of the changes we have seen as early teaching us something about transformations. Possible new transformations may result from new ways of communicating, learning, or organizing, that take place with new types of employment, technologies, and organizations. When looking backward 60 years we should think of new possible transformations and how we survived the last one.

Looking Forward 30 Years

People that study the future suggest that the number of years one looks ahead should be accompanied by twice that number of years looking back. One of the lessons from the previous 60 years is that change can happen quickly and unexpectedly. Another lesson is that consistency matters for vision, values and general goals. History can suggest important elements of the future, but increasingly there are so many new things happening that one needs to maintain relevant consistency in key elements but also anticipate change as part of normal planning processes.

The last update of the College Strategic Plan, Spring 2010, defines the current College approach for likely futures. It assumes that uncertainty, complexity, and ambiguity will be with us while we are going through rapidly changing times. And it indicates that our approach should be flexible, agile, innovative, and responsive to appropriate signals. Of course, college leadership and resources are critical, but we can expect that the type of leadership needed will itself change with the times. When all these factors line up to strengthen each other, we should be more successful.

The current mission statement is brief: "to create, integrate, extend, and apply knowledge." This is quite a contrast to years past when university guidelines indicated a mission statement should not exceed five pages!

The current plan also encourages a signature programmatic focus on "sustainable integrated systems" in the areas of:

- Arid and semi-arid region agriculture and environment,
- Individuals, families, communities, and organizations, and
- Globally-Oriented basic and applied research.

There are six specific focus areas, where most departments are involved in several of the focus areas:

- Environment, Water, Land, Energy, and Natural Resources
- Plant, Insect, and Microbe Systems
- Human Nutrition, Health, and Food Safety
- Animal Systems
- Children, Youth, Families, and Community
- Consumers, Marketplace, Trade, and Economics

The preceding 60 years, may provide some guidance to future leaders of the College as well as faculty, staff, students, and our ultimate audiences. We have learned that:

- History matters but don't assume it defines the future,
- We are experienced at dealing with change – for our clientele and ourselves, and
- The right college and university leadership and resources are critical for the specific time period.

There are many uncertainties – the economy, the globalization of individual countries, resource and environmental trends, and new technological techniques or scientific discoveries. Perhaps the most important factor may be the easiest to ignore: how universities will be managed and what they will do in the future.

When essentially everyone in the world has instant access to very large amounts of information and has access to everyone else in the world, without regard to specific location or method of how that access is achieved, things surely will change. With access to so much information one has to make choices and be careful not to gravitate to easily found solutions that reinforce our own biases. This is where universities can assist in developing new ways of thinking and exposing students to new ideas and new subjects. Just as there is more information available than any individual can comprehend, there are also new ways of organizing and evaluating that information to make it useful. How we evaluate information and give opportunities for critical discussion of the key points is one of our greatest challenges.

In the end, learning is what universities are all about and everyone is involved in it – students, faculty, staff, and extension clients. And the processes of learning are undergoing change as much as every other aspect of College life. It's not hard to imagine an assignment of the future involving a group of students, some of them in other countries or not even members of the class, solving a problem together, and sharing their different perspectives. We already do this with the faculty.

Further Reading

First History Book – 1885-1985

The University of Arizona College of Agriculture: A Century of Discovery. By Richard Haney, Hector Gonzalez and Patricia Paylore. 324 pages (1985). Hardcover.

This book was prepared for the University of Arizona Centennial and contains a wealth of information about the College from its formative days to its transformation to a modern college. It also contains a number of photographs, beginning with 1890. Eight chapters cover various time periods and appendices list deans of the College and directors of the Arizona Agricultural Experiment Station, Resident Instruction, and the Cooperative Extension service. Also included is a list of honorary doctorate of science degrees conferred and a list of distinguished citizen award recipients. Illustrations include a number of sites around the state, various campus buildings, and selected people.

Second History Book – 1980-2010

University of Arizona, College Agriculture and Life Sciences . A Thematic History from 1980 to 2010: Stabilizing, Refocusing, Sustaining. By Roger L. Caldwell. Approximately 200 pages, softcover. To be published Spring 2011.

The second history is an expansion of this publication. It covers a 30-year period in which major changes took place in the College during the administrative terms of three deans: Darrel Metcalfe, Bartley P. Cardon and Eugene G. Sander. The book is divided into seven parts with a total of 24 chapters. Following a section on the early historical context from 1885 to 1951, it continues through the period of 1951 to 1980, describing how the traditional time period began to change and how the College changed in response - sometimes ahead of the need and sometimes behind it, sometimes too fast or too slow. Observations about the most recent 30 years are given from the perspectives of the various administrative units and faculty and staff. Relevant changes in Arizona and the University of Arizona are covered. The book also takes a look back to the previous 60 years for lessons that may help us anticipate the future.

The book has three objectives:

- To provide a history of how the College got to where it is today,
- To serve as a reference manual for historical events, and
- To provide a snapshot of the College in 2010.

The book has a few photographs and a large number of appendices. There are histories of each academic department, Cooperative Extension, and the Agricultural Experiment Station. There are lists of awards given by the College, types of organizations to which faculty belong, and lists of administrators of college departments, Cooperative Extension offices, and Agricultural Centers.

For more information on this second history book, contact:

College of Agriculture and Life Sciences
Publications Office
University of Arizona
Tucson, Arizona 85719
pubs@ag.arizona
520-621-7177

College of Agriculture
and Life Sciences