

Reflections and projections

J.B. KENDRICK, JR.
Vice President —
Agriculture and Natural Resources

With this column, I bring to a close 13 years of commentary in *California Agriculture* on issues, events, and ideas associated with research and education in support of agriculture and the natural resources. I don't mean to imply that I will hereafter remain silent on agricultural issues, but, considering my retirement as Vice President, future commentary will undoubtedly spring forth under different circumstances and perhaps in different forms.

Association with *California Agriculture* has been one of my most gratifying experiences. I have observed with pride the improvement in the magazine's style and format, the quality of its articles, the comprehensiveness of the subject matter coverage, the usefulness of its special issues, and the level of esteem in which it is held by readers throughout the world. It has achieved success through the skillful dedication of its Editor and staff and the high quality of the contributions by others involved with it. I am pleased to acknowledge publicly my appreciation and admiration for all those who have worked so well on behalf of this fine magazine.

I have wrestled with the subject for this "last" commentary. What should I say? It is tempting to reminisce and dwell on past accomplishments. Eighteen years in the Vice President's chair have given me a time-frame by which it is possible to measure changes not visible in shorter spans.

I have been through the era when it was strongly suggested that the "private sector" should pay a greater share of the costs of the University's agricultural research because it benefited directly from our research. That was followed by an era in which equally strong voices suggested that private sector support skewed disproportionately the University's agricultural research to its own exclusive benefit.

I have witnessed the concerns about social disruptions stemming from adoption of technological devices and practices in agriculture. I have observed and encouraged the changing view of the role of chemicals in the management of the health of crop plants. It was a period during which we also saw a heightened awareness of environmental quality and the enactment of laws and regulations that have altered many agricultural practices.

I have watched the increasing appreciation and understanding of the interrelatedness of disciplines in addressing problems that affect various components of the agricultural system. I have experienced the excitement associated with the fast emergence of vastly improved information management made possible by space-age technology and communication innovations. It has been

equally exciting to watch the rapid development of biotechnology and genetic engineering, and to contemplate the benefits that could accrue to agriculture if the potentials of these new approaches translate into actualities. All of these changes have had a profound influence on agricultural research and education.

But I really don't want to dwell on the past. It's more important to consider what happens next.

I see some important new challenges ahead for publicly supported research and extension based on trends and predictions concerning U.S. and world agriculture. These are brought into sharp focus when one studies the Office of Technology Assessment report entitled "Technology, Public Policy, and the Changing Structure of American Agriculture" and information on world agriculture compiled primarily by the Bureau of Intelligence and Research of the U.S. State Department. Even allowing for some uncertainty inherent in long-range forecasting, there is enough evidence in present-day circumstances to validate the general predictions about the nature of U.S. and world agricultural production systems in the years ahead.

It is important to bear in mind two indisputable facts in this discussion: First, the productive capacity of U.S. agriculture is one of the highest in the world. Second, because of this great productive capacity, U.S. agriculture produces food and fiber far in excess of the demands of our domestic markets. Consequently, for economic survival, it is imperative that our major crops and many of our specialty commodities find receptive and rewarding foreign markets.

It is not an unwarranted prediction to say that the products of research in biotechnology and the incorporation of "space age" technologies into our agricultural systems will lead to even greater productive capacity.

With these facts in mind, let's look at what is predicted for U.S. farms and worldwide production agriculture. For the convenience of making comparisons, U.S. farming units are classified into three categories according to the value of products sold. Large farms have sales value exceeding \$250,000 per year, moderate-size are those with sales between \$100,000 and \$250,000, and small and part-time farms are those below the \$100,000 sales level. It is important to note that generally moderate, small, and part-time farm operations require sources of nonfarm income to survive.

In 1982, there were about 2.2 million farming units in the United States, 87 percent of which were in the small or part-time category. By the year 2000, it is predicted

that there will be about 700,000 fewer farms in this category, representing 68 percent of the total farming units. At the other end of the spectrum, in 1982 there were about 86,000 large farming units, or nearly 4 percent of the total. By the year 2000 this category will increase to 370,000 units or about 20 percent of the total, a five-fold increase in less than 15 years. Moderate-size farming units are predicted to remain at about 10 percent of the total, or approximately 200,000 units.

Even more startling is the prediction that by the year 2000 the large-farm category will capture 85 percent of the total farm cash receipts, and, as far as productive capacity is concerned, that the 50,000 largest farms in the United States, only 3 percent of the total, could market 75 percent of our major farm products. These 50,000 farms could utilize 60 percent of total U.S. farmland.

There seems little doubt that small and moderate-size farms, constituting 80 percent of the total 14 years hence, will require off-farm income and assistance in adopting new agricultural technologies if they are to survive. This change will have a far-reaching effect on public policy governing agricultural research and extension.

International trends will also affect the structure of U.S. agriculture and influence publicly supported agricultural research and extension. The rapid increase in productivity that characterized U.S. agriculture in the 1950s and '60s is now occurring in all of the major agricultural regions of the world. New short-season corn hybrids have expanded corn-producing areas, and other improvements in varieties of cotton, rice, and wheat will increase the yields of these crops, particularly in Africa and South America. Expansion of irrigation and improving drainage are responsible for increasing productive acreage in the Middle East. Dramatic increases in production of basic agricultural commodities are expected in Argentina, Brazil, and China, to name only the most obvious of the nations expected to increase their agricultural production and their agricultural export activities.

Rising worldwide productivity means that U.S. agriculture will face fierce competition for international markets. The role foreign trade policies of individual or groups of countries play in the success or failure to compete for foreign markets is complex and beyond this discussion. It is, however, a critical factor in the viability of agriculture in any exporting country.

For U.S. agriculture to remain competitive in this international trade environment, it must continually improve its productivity and its efficiency. This almost guarantees the continuation of research into biotechnological applications for agriculture and into further development of systems for managing information vital to successful agricultural activities. For the most part, the development arising from this research will be applicable to all farm sizes.

The motivation for choosing this subject for discussion in the first place was my conviction that the leadership of

state Agricultural Experiment Stations and Cooperative Extension urgently need to begin adjusting their programs so that the public interest is served within these new circumstances. Publicly supported research and extension activities are justified when they serve the public interest. It is debatable to assume that research and extension programs designed primarily to serve the needs of the 50,000 largest U.S. farming units are in the public interest. It does not seem debatable, on the other hand, to conduct programs that will result in assuring the public that the natural resources used by agriculture regardless of farm size are maintained in a viable and healthy state and that agricultural practices are not hazardous to people's health. Activities that are broadly applicable to all agricultural enterprises must be the dominant feature of the research menu at state Agricultural Experiment Stations and in federal programs.

The most significant change required for the future involves Cooperative Extension. For a substantial number of the moderate-size farming units to survive, Cooperative Extension will need to direct its primary attention to this group. It must assist these farming units in adapting the new technologies on the same time schedule as the large and more independent units, and it must help the moderate and small-unit farmers market efficiently and effectively at home and abroad. To do this, its personnel must become increasingly engaged in applied and site-specific research activities. If this isn't done, an important feature of our rural environment will disappear and rural America will be damaged.

I see the possibilities of many exciting and rewarding programs ahead for both agricultural research and extension at state universities, but only if they redefine their objectives and recognize the changing structure of U.S. agriculture.

As I leave the active arena of agricultural research and extension administration to assume a passive role as observer and occasional commentator, I challenge my younger colleagues to heed these trends and to be forthright and imaginative in designing future programs to serve the public interest. If the leadership is willing to do so, I believe the achievements of the future will more than match the remarkable ones of the past.

On the cover:

Dr. James B. Kendrick, Jr., Vice President of Agriculture and Natural Resources of the University of California, was scheduled to retire on June 30 after 40 years of service with the University, 18 of them as Vice President. No other person has served as a UC Vice President as long. At the request of University President David P. Gardner, Dr. Kendrick has agreed to postpone his retirement until September 30, 1986.