J. B. KENDRICK, JR.
Vice President—Agricultural Sciences
Director, Agricultural Experiment Station
and Cooperative Extension

Social impact of agricultural research

Science-based technology has been described as the principal tool our civilization has devised to alleviate the condition of man. We enjoy comforts, conveniences, and an expanded world of travel and communication made possible by technological progress. The plentiful supply of food we take for granted is available, because science has helped agriculture move from hand tools and horses into the age of technology along with other segments of our economy. Certainly, there are compelling reasons—social, political, and economic—for increasing agriculture's efficiency and productivity, which is a central objective of the University's Division of Agricultural Sciences.

It was therefore unsettling to hear the view expressed in some quarters recently that the University's agricultural mechanization research is not consonant with the public interest. One contention was that University-developed technology, such as the mechanical tomato harvester, results in unemployment and that further mechanization research should not be conducted until its impact on farm laborers can be determined.

While it seems virtually impossible to predict accurately the total social impact of research before it is accomplished, there is ample evidence to show that the very serious problem of unemployment is alleviated more by expansion than by restriction of technical innovation.

Introduction of the tomato harvester did, in the short run, reduce labor requirements in the field, but it also brought about a significant increase in California's production of processed tomatoes. Tomato acreage increased from 143,000 to 233,800 acres—a 63 percent rise—as a result of the machine harvest method. When the expansion of processing, transportation, and other activities associated with this increased production is considered, total employment in this industry has increased. Moreover, one of the most physically debilitating stoop-labor tasks was eliminated—a constructive human labor improvement. Some view this as a sociological gain.

Conversely, *without* this technological development, all jobs associated with the tomato processing industry might have been lost. A case in point is California's processed asparagus industry. Efforts to mechanize harvesting so far have been unsuccessful. Because of relatively high production costs, export markets for California canned asparagus have been lost to foreign producers. In recent years, California's production has decreased from 74,000 to 34,000 acres, and jobs in production and processing have been correspondingly reduced.

California farm products are marketed in highly competitive national and international markets, where a small cost disadvantage causes the loss of a market abroad or leads to competition from imports at home. An unfavorable shift in international trade in agricultural products seriously affects our ability to support many essential imports, such as oil, ores, and other minerals, as well as our ability to compete with agricultural trade of other countries.

Technical innovation in all industries has been accompanied by an expansion of job opportunities in the total economy. Agriculture cannot be singled out as a nonparticipant in the age of technology. Technical innovation is the primary source of increased worker productivity—the *real* basis for increased farm worker wages. During the period since 1960, in which significant increases in farm mechanization occurred, average farm wage rates in California increased 121 percent.

Failure to introduce technical innovations that lower costs and raise productivity would result in greater increases in food prices. The economic impact of higher prices is, in reality, a social impact. It is felt most severely by low-income families, whose food purchases comprise a far greater share of total family expendable income than the 17 percent frequently cited as the portion spent on food by the average family.

Perhaps the most productive intellectual achievement of modern man has been his increasing capacity for discovery and invention. Creative risk-taking and freedom to follow ideas wherever they lead are at the very core of the research process and have accounted for many unpredictable but notable scientific achievements. One added violation of the principle of freedom of inquiry—one more unproductive restriction on what research should be done and how it should be done—will have an unfavorable impact on the economy, on agricultural producers, on farm workers, and on the consuming public. Who among us is wise enough to foresee the total impact that new ideas and innovation might have on mankind? The real challenge to all of us is to adapt innovation to the good of all people rather than to fear the exploration of the unknown.