

The U.S. food and agricultural sector enters the decade of the 1990s facing many new problems and issues that will challenge the agricultural research and extension (AR&E) system. A major focus of the system has been to increase productivity on a continual basis. In the decade of the 90's productivity will continue to be a concern, but additional concerns for food safety and for the environment will become equally important.

Agricultural productivity gains are slowing throughout the world. The slowdown, however, is more pronounced in the United States than elsewhere (16). As the U.S. agricultural sector slips from global leadership, its role in strengthening the nation's economy could decline. At the same time, however, consumers domestically and abroad are increasingly concerned about the safety of the food supply, and demand is growing for more emphasis on producing a safe and nutritious food supply at relatively low cost.

There is also increasing concern that gains in agricultural productivity not come at the expense of the environment or of biological and genetic diversity. Contaminants from a variety of current agricultural practices negatively affect water quality; certain agricultural practices also contribute to the release of greenhouse gases, possibly changing global atmosphere.

Meeting the challenges posed by these broadening concerns will require an AR&E system with an effective national strategy. It will also require advances in science and tech-

nology of a scale and scope the system has not previously experienced.

Fortunately, the food and agricultural sector stands on the threshold of a new technological era – the biotechnology and information technology era. This represents the third major technological era of the century following the mechanical era (1920-1950) and the chemical era (1950-1985). Biotechnology (recombinant DNA, cell biology, genetic manipulation) and information technology (artificial intelligence, expert systems, computers, networks) hold great promise for solving problems in the food and agriculture sector.

A pressing question is whether the AR&E system is capable of capturing the potential these new technologies promise. The development of these promising technologies will require a different environment than that of previous technological eras. Agricultural scientists will need to thoroughly understand the basic science underlying the technology and the AR&E system will have to be flexible and adaptive.

This report focuses on two major challenges to the AR&E system: 1) a broadening of problems to solve and 2) the advent of new technologies for solving these problems. The report identifies the problems these challenges bring to the system and concludes with a set of alternatives for structuring a national agricultural research and technology transfer policy that will help the system meet the needs of the next decade.