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## Earning public support

There is something mystical and exciting about the beginning of a new century. Maybe that's why we see so much these days about the year 2000, now less than 15 years away.

In agriculture, we hear about the world population at the turn of the century, and of the demands for food and fiber that will be placed on our production system. We hear scientists talk about new technology and how it will help meet the demands of the future. We hear about the limitations of our natural resources and the diminishing quality of our environment, and about the rapid "globalization" of production and marketing systems that used to be community and local activities.

The year 2000 may be the start of a new millenium, but it will not signal the end of all our problems. The issues facing agriculture and the world food supply will remain, and probably will become more complex.

We will have to continue to improve our productivity, but not at the expense of the quality of our environment or of our natural resources. There is no single discovery or advancement that can be added to the agricultural system without interacting with a multitude of other variables.

What tactics, what methods, what systems will enable us to continue to increase the productivity of our farms while making this globe a better place to live? We must use every tool known to science to ensure an adequate supply of food and fiber, to sustain our natural resources, to keep our air and water clean, and to continue to improve the quality of life for all. It can't be our goal to discontinue the use of chemicals, gamma radiation, genetic engineering, beneficial parasites, or vaccines. It can't be our goal to eliminate the use of improved farm equipment, or to eliminate corporate farms or large farms or small farms. We've got to recognize the appropriate uses and limits for every component of our great agricultural system.

We have to carefully and scientifically evaluate every alternative, to reduce costs, to make food safer, to make water cleaner, and to make forests more productive yet more esthetically satisfying. Whether it is a controlled burn, a hard tomato, a new pesticide, or a new system of nitrogen fixation, we must keep open minds. If we close our minds to the potential of any new technological approach, we eliminate opportunities for the future.

Research and education in our universities continue to develop the knowledge that will enable us to sustain our agriculture.

But that is only the beginning. The people who live in our world and who benefit from our discoveries are often fearful of new technologies and hesitant to relinquish old ways. It's not enough to expect new ideas to be accepted by the public simply because they're new ideas. Universities, state and federal agencies, private companies, agricultural organizations, and farm leaders must all do a far better job of helping the public understand both the complexities of producing food and fiber and the real risks and benefits associated with a new development.

I was extremely pleased to read Marjorie Sun's article in the March 7, 1986, issue of *Science* reporting that the Monsanto Company had agreed to make public virtually all the information it had submitted to the Environmental Protection Agency on a genetically engineered *Pseudomonas fluorescens*, a toxin against the cutworm on corn. The company had conducted toxicity assays on "fish, aquatic insects, mosquitoes, laboratory mice, earthworms, and quail, and found no untoward effects." If Monsanto now uses this information in the course of its general public awareness campaign, I predict that an educated public will be much more accepting of the small risk associated with such an engineered microorganism.

In California, Advanced Genetic Sciences recently proposed releasing the ice-minus nucleation bacteria, engineered to protect plants against freezing, without carrying out a public awareness effort in advance. The result was predictable: the people of Monterey County rejected the proposal because they didn't understand the risks or the benefits. The unfortunate part of this case is that there is probably no risk involved with the ice-minus bacteria. The manner in which the release of the organism has been handled, however, has done nothing except heighten public concern and suspicion.

The discoveries that come along with a new millenium will undoubtedly be more difficult for all of us to comprehend and evaluate. But they are the discoveries that will sustain our agriculture as a productive and profitable enterprise, and they will sustain the quality of our environment. We will have to convince ourselves as scientists that they are indeed beneficial, and we will have to convince the public that they are safe. All of us have that responsibility; we cannot escape it.