Another Plea for Agricultural R&D

American agriculture and the research infrastructure that serves it must undergo a revolution to still the economic turmoil affecting the farm sector and to make U.S. agriculture competitive in domestic and world markets. With overseas producers becoming more efficient by the day, American farmers will have to rely on research more than ever to lower production costs, says the National Research Council (NRC) Board on Agriculture.

Whether the U.S. research apparatus will come through with the innovations needed is in doubt. In *Agriculture Biotechnology: Strategies for National Competitiveness*,* the board observes that "current political and economic policies governing agriculture" have failed to fully recognize the speed with which the rest of the world is using technology. The challenge before American agriculture is to refocus research in agriculture especially as it relates to biotechnology.

Advances in agricultural biotechnology will not come easily, however, says Charles E. Hess, dean of the College of Agriculture and Environmental Sciences of the University of California at Davis. It "will require a large up-front investment in basic research," says Hess, who chaired the board's study. Some funds can be provided by industry and the states, he says, but most of it will have to come from federal coffers.

Without added support, the board warns, not only will research lag, but American industry may find itself with a shortage of research personnel. The report makes the following recommendations with respect to overhauling agricultural research:

- Lift the average research grant from the current average of $50,000 over 2 years to $150,000 over 3 years. And, by 1990, hike public support for competitive, peer-reviewed grants from its present level of $150 million to $500 million. This level would support 3000 researchers.
- Support at least 400 postdoctoral positions at universities. Funding for such positions within the Department of Agriculture has withered in recent years.
- Retrain federal and university-based scientists at the rate of at least 150 a year for at least 5 years.

More money is not the only prescription, though. Research efforts in agriculture must be integrated to a much greater extent, says Hess. More collaborative exchanges must occur among researchers in land-grant institutions, non–land-grant universities, industry, and government laboratories. Such cooperative efforts should be encouraged at both the graduate and the faculty level.

At the same time, the NRC report says research in physiology, biochemistry, genetics, and molecular biology needs to be focused more on aiding the identification of genes in animals, plants, and microorganisms. While noting that steps have been taken in this direction, the board says, "far more impetus is needed to ensure the continued success of American agriculture in an ever-changing world economy."

Techniques for applying the knowledge garnered from research also must be expanded and refined. Gene transfer in plants, animals, and microbes; plant cell culture and regeneration; and animal embryo culture and manipulation are areas where more work is needed, according to the report.

To ensure that products can move from the laboratory to the market, the board recommends that five to ten existing agriculture field stations be designated as sites for conducting initial tests on engineered organisms. These facilities would be managed by a committee of scientists from the public sector who have backgrounds in agronomy, ecology, plant pathology, entomology, microbiology, molecular bioscience, and public health. ■ **MARK CRAWFORD**

**Agricultural Biotechnology: Strategies for National Competitiveness*, National Academy Press, 2101 Constitution Avenue, NW, Washington, D.C. 20418.

Glasnost and the Soviet Environment

Glasnost is good for the environment. That, at least, is the word from Moscow, where several top Soviet officials have recently been fired or reprimanded for failing to take adequate action to protect two of the Soviet Union's largest freshwater lakes—Lake Baykal in Siberia, and Lake Ladoga, the principal source of drinking water for Leningrad—from the effects of industrial pollution.

Ten years ago, a prominent Soviet author wrote that there were "no signs" in the U.S.S.R. of the ecological crisis being experienced by capitalist countries. In the same period, a senior Communist party official, responding to criticism from members of the Academy of Sciences of plans for the industrial development of Lake Baykal, argued that protective measures were being undertaken that would ensure "not only the preservation but even the augmentation of the natural riches of the Baykal basin."

Last week, in sharp contrast to such statements, the Central Committee of the Soviet Communist Party passed a resolution outlining the need for new steps to protect Lake Ladoga, and denounced "the irresponsible and negligent attitudes of leaders of all ranks to environmental protection as a major social and economic miscalculation."

The resolution came 2 weeks after the Central Committee announced that a deputy minister in the Ministry for Timber, Cellulose, and Paper and Woodworking Industry—the government body formally responsible for some of the main industrial developments around Lake Baykal—had been "freed from his post." The committee was also "taking into consideration" an application for early retirement from the first deputy chairman of the U.S.S.R. State Commission for Forestry, and had reprimanded officials from other agencies.

Among the charges levelled at the deputy minister was the "unsatisfactory implementation" of a Central Committee resolution passed in 1977 on setting up a closed-circuit water-supply system at a cellulose and cardboard enterprise at Selenginsk. This move was much praised in the Soviet press at the time as a response to concerns that the cellulose production would pose a major threat to the lake's 600 plant and 1200 animal species.

In the case of Lake Ladoga, the Central Committee admitted that the discharge of untreated industrial effluent over a period of several decades from a major cellulose factory in Prioszersk had created "an extremely serious ecological and sanitary situation."

Among the list of government bodies to which it allocated blame were the Academy of Sciences and the U.S.S.R. State Committee for Science and Technology. Both of these, it said, had tolerated "inadmissible delays" in developing a scientifically sound regime for using the natural resources of the Lake Ladoga basin. The operation of the cellulose works has now been stopped.

Production of cellulose will also be halted at Lake Baykal. The deepest and most voluminous freshwater lake in the world, Lake Baykal, has been a principal focus of warnings and complaints by Soviet environmentalists for more than 20 years, and it has been viewed as a symbol of the damage being caused to other lakes and rivers throughout the country.

According to Central Committee member Nikolay Talyzin, quoted by the Soviet news agency Tass, the construction of new enterprises around Lake Baykal and the extension of existing ones will only be allowed in "exceptional circumstances," and all forms of economic activity around the lake will be strictly monitored. ■ **DAVID DICKSON**