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Plant science research

Plants are essential to our survival and well-being: They are food and fiber, color and beauty, shade and shelter. But they're so abundant and persistent that we tend to take them for granted. In 1985, basic research on human health received $2.1 billion from the federal government; plant science research received only about 5 percent of that, or $110 million.

I'm not suggesting that there is a real risk of plants becoming extinct. Nor am I making an appeal here for more money for plant science research just to maintain productivity — although I'll promise that, in the first 20 to 25 years of the twenty-first century, the percentage of the consumer's budget spent for food will be double the present-day 15 to 16 percent if we don't increase the research money spent on plant science.

The real issue facing plant science is that of the impact that producing our food has on the quality of our environment. A recent report from the U. S. Department of the Interior indicates that, of all the toxic problems associated with natural systems, almost half were caused by agricultural pollution. If we don't want to continue to be faced with the nasty problems of groundwater pollution, rising water tables, saline soils, and impaired wildlife, we'd better start thinking about the real alternatives. The only choice is to move forward as rapidly as possible to increase our basic knowledge of plant sciences that will get us off the treadmill of mounting environmental problems.

The very nature of agriculture means that treatment with a pesticide or herbicide entails a broad application of that material over millions of acres. Present knowledge does not make it possible to produce enough food to meet the needs of our own country, let alone the rest of the world, without using a wide range of chemicals. Some of these have absolutely no detrimental effect on the environment. Others cause serious concerns and may contaminate our water supplies or, if used inappropriately, make food unsafe for consumption.

One reason that we have to use so many chemicals to protect plants is that many of these plants have been brought from other parts of the world. They've become established in a new environment accompanied by only part of their natural ecosystems. Beneficial soil or plant organisms that may have protected them in their native environments are not present to protect them in their new surroundings.

It is also true that, as we developed plant monocultures, we eliminated some of the ecological variability essential to maintain a system that can protect itself. And it is probably true that some of the varieties we have developed for increased productivity may have become, in the process, more susceptible to some detrimental organisms. Many of these deficiencies that require the constant protection of chemicals might be corrected if we knew enough about the basic plant system to alter its genetic makeup or even its culture.

Irrigated agriculture has many of the same problems. We will be able to develop plants eventually that require far less water and thus make our water-soil management systems less complex and less susceptible to problems associated with the accumulation of salinity and trace metals.

The human health and environmental issues facing this globe in the coming millenium will be determined by our knowledge of the basic biology of plants. Since human health depends upon food produced by plants, perhaps it isn't too much to think that basic research on plant biology should be funded at least at 50 percent of the level of research for human health.