Food for the Future

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Food for the Future

Readers energized by Fred Powledge's Feature about hunger and global food insecurity (p. 260) would do well to digest the January report from the Council for Agricultural Science and Technology (CAST), *Agricultural Productivity Strategies for the Future: Addressing U.S. and Global Challenges* (available at *www.cast-science.org/*).

The report bleakly warns against complacency and identifies converging factors bringing about a "perfect storm" in global agriculture: chiefly, the still rapidly growing world population, increasing demands on agriculture for fuel and ecosystem services in rich countries, and climate change. The medium projection of global population growth by the United Nations will require "a near doubling of agricultural output from 2000 to 2050"; moreover, the "demand for bioproducts and biofuels is virtually unlimited at expected future energy prices, but resources for production will constrain supply."

Despite its numerous disturbing statistics and projections, the report is clear about how greater global investment in research, as well as other policy changes, could still increase productivity and ameliorate the tightening agricultural supply-demand balance. In the report's preface, the late Norman E. Borlaug, in what may be his last published writing, reiterates his call for a "Second Green Revolution" and stresses the importance of communicating the facts about agricultural issues to the general public as well as policymakers.

The report, written by a task force chaired by Gale Buchanan, of the University of Georgia, is not shy about addressing broad issues. "Correcting pathologies in the broader U.S. economy can reinforce the ability of agriculture to increase its productivity and exports," it declares. It is also unambiguous in its support for the development of more genetically engineered crops: In the United States, such crops have yielded "evident benefits to the environment." Bioengineered crops, the CAST report maintains, decrease soil erosion and improve water quality by reducing the need for mechanical cultivation. Plants bioengineered to cope better with heat, salinity, and moisture stress could offer substantial new benefits not only for the United States but also for tropical and subtropical areas. Such crops need to be monitored for safety, the CAST report states, but "excessive caution can seriously undermine U.S. and global efforts to serve future demands on agriculture."

Internationally, the CAST report draws attention to a shift of international support away from agricultural research and development that occurred during the 1990s, despite its historically high rates of return. Although investment has since increased, the authors contend that the United States "will need to make additional investments to raise the productivity of U.S. agriculture" as well as increase assistance to developing countries. The report lists current research that could benefit productivity: enabling C_3 plants to use the C_4 photosynthetic pathway, introducing nitrogen fixation into nonlegumes, incorporating apomixis into crop plants, enhancing water and nutritional efficiency of crops, and improving crop pest resistance and energy efficiency, among others.

The needs could not be clearer: Prudent policy will have to involve more agricultural research. Whether the fractious US Congress will have the foresight to allow it is far less clear.

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