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Theme Overview: A Future Informed by Agricultural and Social Sciences

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JEL Classifications: O3, O4, Q16, Q18, H54
Keywords: Agriculture Science Policy, Food Security, U.S. Competitiveness, Research Investments

Articles in this theme

New Insights on the Impacts of Public Agricultural Research and Extension

30 and Daisy: Where's the Economics in Beef Cattle DNA Testing?

Experiences and Prospects of Genetically Engineered Crops

Two facts widely acknowledged for some time are increasingly being linked to conclude that the United States has an urgent need to increase its investment in agricultural research: First, the latest population projections from the Food and Agriculture Organization of the United Nations indicate that by the year 2050 the world population will likely increase by 2.4 billion people, reaching 9.7 billion total people and requiring more than a 60% increase in food production from the 2005 level (FAO, 2012; FAO, 2015). Secondly, the major source of growth in agricultural output is due to productivity growth spurred by research innovations, rather than increases in inputs (Heisey, Wang, and Fuglie, 2011; Wang, et al., 2015). Moreover, global food security as a motivation for increased investments in agricultural research is often complemented by the goal to maintain the competitiveness of U.S. agriculture amid uncertainties and challenges due to global climate change.

Diverse groups have recently taken strong positions in support of increased investments in public agricultural research, including producer groups—such as the American Farm Bureau Federation, advocacy groups—such as Supporters of Agricultural Research (SoAR), and international organizations—such as the United Nations Millennium Development Goals.

Perhaps these voices are being heard. The President's FY2017 Budget calls for a total investment of $700 million for the Agriculture and Food Research Initiative (AFRI) research program administered by the National Institute of Food and Agriculture, USDA. AFRI funds are competitive grants which supplement the formula-based Hatch Funds. The $700 million included in the President's budget is the fully authorized level established by Congress in the 2008 Farm Bill, which has never been fully funded in the annual appropriations process. Only one-quarter of the estimated cost of proposals viewed as highly worthy of funding by scientific review panels could, in fact, be funded with the appropriated funds in recent years. For example, the FY2016 funding level was $350 million—half of the fully authorized level but which represented a $25 million increase from FY2015. Recently, both the U.S. House of Representatives and the U.S. Senate Committee on Appropriations approved a $25 million increase for FY2017.

The focus of this *Choices* theme is to underscore the importance of investing in public agricultural research. We do this, first, by providing an overview of trends in U.S. investments in agricultural research and the extension of that research to users. Secondly, since it is impossible to comprehensively describe the contributions made by recent research investments in a *Choices* theme, instead we describe examples of recent agricultural research, one in the livestock area and another in the crops area. (For a more thorough presentation of NIFA's program see USDA, OBPA, 2017.) Huffman's article on U.S. trends shows that after growing rapidly from 1960-1982, growth in public agricultural research investment in the United States then slowed considerably, and even had subperiods of real decline. Huffman also provides measures of social internal rate of return to investments in productivity-oriented public agricultural research and extension, reporting larger rates of return than other recent studies.

The Ballenger, et al. article addresses productivity in the livestock sector for a world population with an increasing demand for meat. Emerging beef genomics research is able to match information on cattle DNA profiles with economically important traits in the marketplace. Cattle producers are currently able to purchase genetic tests for simple traits or relatively comprehensive genomic prediction tools of economically relevant complex traits. The authors review the recent advances in genomic science, interpret those for the *Choices* audience within the context of the supply chain and likely consumer acceptance, and consider the implications of those advances for ranch profitability. It is also worth noting that the research team collaborating on the article is an excellent example of the highly endorsed multidisciplinary approach for translating basic science research into useful applications for stakeholder groups.

The Falck-Zepeda article focuses on the crop sector and the hot-button topic of genetically engineered crops. Approximately 12% of global crop land acres are currently planted to GE crops. While the scientific evidence to date indicates that GE technologies are key to future food security and sustainability, others believe perceived potential threats are not worth the price. The author was a member of the National Academy of Sciences Committee who produced and recently released a much-anticipated report which assessed the existing scientific evidence to offer conclusions and recommendations to help the public and policy makers better understand the issues. His article provides a summary of the key issues addressed in the report, considering economic and social impacts, safety, trade, institutional, regulatory, and policy issues for a world which is increasingly interested in learning more about agricultural production processes.

For More Information

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