

**NATIONAL AGRICULTURAL RESEARCH, EXTENSION,
EDUCATION, AND ECONOMICS ADVISORY BOARD**

HIGHLIGHTS OF MEETING AND FOCUS SESSION

October 27-28, 2010

The NAREEE Advisory Board heard presentations and held discussions on the roles and responsibilities of USDA's Research, Education and Extension (REE) mission agencies in the area of *agricultural productivity and returns on investment in agricultural research*. The planning committee that organized this focus session will develop more a complete report and recommendations on this topic in coming weeks. The following is a summary of the Board's deliberations during the focus session.

Agricultural Productivity and Returns on Investment in Agricultural Research

Over the past 100 years, global food prices have declined in real dollars because of the rising productivity of agriculture. However, productivity is a relative measure that includes all inputs and outputs across the entire sector, including policy factors such as price supports, export policies and exchange rates, as well as natural resources and new technologies. Furthermore, the benefits of new technology may not be felt as increased yields for as much as 20 years after the research is funded. As a result, it can be a difficult and complicated task to determine just what return we are getting for the dollars we invest in agricultural research.

Dr. Keith Fuglie (ERS) presented an analysis at the global and national level based on a more sophisticated measure called *total factor productivity* (TFP) – the amount of output per unit of all of the inputs used in production. In essence, TFP measures the effect of increasing the quality those inputs and the efficiency with which they are allocated. These are precisely the contributions made by research, extension, rural education, and agricultural infrastructure – in other words, “agricultural R&D.” Using this more detailed analysis, economists have determined that the rate of global agricultural productivity growth has actually declined since 1961, but that an increasing proportion of that growth is coming from growth in TFP. These gains aren't evenly distributed, however, and some countries (e.g., Malaysia, China, Brazil, Chile) enjoy TFP growth over 2.3 percent per year, while others (the former Soviet Union, sub-Saharan Africa) have rates under 0.6 %/yr. The United States, at 1.6 %/yr, is in the middle rank of TFP growth.

Further analysis shows that countries with greater research, extension and education capacity have achieved both (a) more rapid TFP growth and (b) a higher rate of social return on their investment in agricultural research. In the United States, agriculture research spending (of which only 40 percent comes from USDA) represents less than 2 percent of gross domestic product (GDP), yet it has been responsible for more than 12 percent of TFP growth in the entire U.S. economy. These benefits are widely dispersed in society, mostly in the form of lower prices, but the total social return on investment in agricultural research stood at 47 %/yr in 2000. Fuglie concluded by observing that, in economic terms, this continued and oversized

contribution to the growth of the U.S. economy suggests that the United States has been underinvesting in agricultural research, extension and education.

Dr. Wallace Huffman (Iowa State University) presented a state-level analysis based on measurements of *public agricultural research capital*, which includes both federal and state government spending that focuses on agricultural productivity (about 70 percent of total), and the workforce, facilities and expertise that it creates, averaged over 35 years (1970-2004), plus “spillover effects” from relevant expenditures in other states. Analysis shows that public research capital has grown steadily in some states, while in others it plateaued in the 1980s, and in a few it has declined since that time. Not surprisingly, states with flat or declining investment in public research capital have experienced slower TFP growth over time and reduced competitiveness, losses that are hard to make up in later years. Huffman added that his model, including spillovers and private investments, suggests that the real rate of return on agricultural research is between 55 and 60 percent per year.

William Leshar described industry involvement in the Global Harvest Initiative, a public-private partnership to increase agricultural productivity. Corporate interest was spurred by the sudden spike in food prices in 2008 and the recognition that to feed the world’s anticipated population of 9 billion in 2050, we must double food production over 40 years, with no new land and growing competition for clean water. This in turn will require us to increase global TFP growth from the current 1.4 %/yr to 1.75 %/yr. Global Harvest plans to release white papers this year with findings and recommendations in five areas – research, trade, new technologies, economic development, and greater private sector involvement – and will publish an annual GAP Report describing progress on global agricultural productivity. Leshar indicated that the white paper on research will conclude, among other things, that agricultural research at USDA is woefully underfunded, especially in comparison with NSF and NIH, and will therefore recommend a significant increase in funding.

The Board held a wide-ranging discussion of these presentations, and members returned to the topic of productivity growth again and again in response to further presentations about the REE Strategic Plan, the vision and plans of the REE mission agencies, USDA’s communications strategy, and the budget mood in Congress. They agreed that there is a need for strategies to accelerate the diffusion of new technology, and to raise TFP growth in low-performing states and nations, and to include underserved communities and subpopulations in this effort. But if the challenge is to double agricultural productivity, then the more immediate question is why Congress had failed in recent budgets to maintain adequate funding for agricultural research. Historically, it has been difficult to get commodity producers to support increases in research funding; Congress doesn’t like it when there are competing proposals (e.g., Create21 and NIFA), and the research title may suffer from being the last thing the committees write. Whatever the reasons, however, Congress has underfunded agricultural research in recent years, and the prospect is for actual cuts in the future.

In response to this prospect, the Board resolved to “double down” – to advise the Secretary to ask for, and the Congress to approve, a doubling of the budget for agricultural research, just as they have done in recent years for NIH and NSF. To launch and catalyze this effort, the Board will compose and publish a concise, well-reasoned statement that positions agriculture as the solution to a series of real and compelling problems – not just world hunger,

nutrition and food safety, but also job creation, exports, economic competitiveness, national security, sustainability, even renewable energy and climate change. To move this forward, the Board formed a subcommittee to begin drafting the statement and to work with the REE Office of Communications on testing its wording and message.

Board Matters

The Board held a three-hour orientation session for new members before convening the general meeting. During the general meeting, the Board acknowledged the service of Dr. Martin Massengale and Dr. Walter Armbruster, the outgoing Chair and Vice Chair. Massengale, in his parting remarks, observed that that agricultural research is woefully underfunded and that a far more effective public relations effort is needed to inform the public and the Congress on the benefits of agricultural research.

The Board heard remarks from Dr. Catherine Woteki, Undersecretary for REE, USDA, who said that the food and agriculture sector faces challenges and opportunities in five priority areas: climate change, food security, bioenergy, food safety, and nutrition/obesity. USDA will need to find new and compelling ways to talk about science and research, and she invited the Board to comment on the draft Roadmap and on the Action Plan that she will submit to the Secretary before Christmas. The Board also heard a presentation from Rick Borchelt, Director of the REE Office of Communications, about improving USDA communications strategies and launching an online magazine at the February 2011 AAAS meeting.

The Board also heard reports from its two standing committees, Renewable Energy and Specialty Crops, and from a working group on Sustainability in Support of Food Security. It also tasked the planning group on Agricultural Productivity to prepare its report quickly. The subcommittee on Relevance and Adequacy is working on its report, due in the first quarter of 2011. The Board also formed a new working group on Competitive Grants, which might be the topic for the spring 2011 meeting.

By acclamation, the Board elected Jean-Marie Peltier as Chairman and Dr. Mary Wagner as Vice Chairman of the Board, respectively, for FY2011. The Board also elected the following members to serve on the Executive Committee for FY2011:

- Dr. Carrie Castille;
- Dr. Nancy Childs;
- Dr. Nancy Cox;
- Dr. Steven Daley-Laursen;
- Dr. Dennis Heldman;
- Leo Holt; and
- Terry Wolf.

The Board did not set dates for its next meeting, but it will occur in March 2011. Board staff will canvass members for exact dates.

Action Items

- * Board staff will post all of the PowerPoint presentations from this meeting to the Board's website, including the presentation from the REE Office of Communications.
- * USDA Office of Congressional Relations will provide members with an analysis of election impacts and relevant committee members in the new Congress.
- * Board will provide REE Undersecretary with comments on the draft Roadmap and Action Plan.
- * Board staff will try to send briefing books to members in advance of meetings, so they can prepare before the meeting starts.
- * REE will provide members with an analysis of who owns U.S. debt.
- * REE staff will provide members with a summary of committee and working group assignments and report deadlines.
- * The Executive Committee will hold its first teleconference within two weeks to discuss its response to the Undersecretary and the "double down" campaign.