Study shows trends in public and private agricultural R&D

November 28 2012

Analysis published by the U.S. Department of Agriculture's (USDA) Economic Research Service (ERS) in the most recent issue of the journal *Science* examine the relationship between public and private investments in research and development (R&D) and their importance in agricultural input industries. The *Science* article is drawn from a recent ERS study that provides new details on the rapid growth and changing composition of private investments in global agricultural R&D and traces the implications for agriculture.

"Agriculture is more dependent on scientific innovation than any other industry," said Catherine Woteki, USDA's Chief Scientist and Under Secretary for Research, Education and Economics. "This study shows the great job that private industry is doing in research, much of which was built on the genetic technology USDA scientists have been working on for decades. It's crucial that we continue supporting this kind of R&D."

Research discussed in the article notes that globally, most of the increase in agricultural production over the past 50 years can largely be attributed to rising crop and livestock yields rather than to the expansion of acreage devoted to farming. As private sector investments comprise a greater and growing share of overall R&D spending, the findings from this study will help trace their influence on future productivity gains. The article also discusses how growth in private R&D helped to offset the sluggish growth in public R&D, describes how public research has provided many of the fundamental discoveries, and highlights overlooked research

areas that consequently attract private R&D.

Reliable estimates of publicly funded agricultural research have previously been available, and studies have established strong links between these investments and the long-term growth of the productivity of American agriculture. But the ERS study is the first of its kind to provide comprehensive estimates and analyses of private sector R&D for agricultural input industries, even for global companies with R&D endeavors in different countries and sectors. The report defines agricultural inputs as animal genetics; animal nutrition; animal health; farm machinery; fertilizers; crop seed and biotechnology; and agricultural chemicals.

Findings reported in the *Science* article include:

- Globally, about half or more of all private investment in food and agricultural research and development have been devoted to food manufacturing, not toward input industries and other areas that directly increase agricultural production.
- Recent increases in private agricultural input research have mostly centered on crops, including farm machinery and some biofuels investments; livestock-related research and crop protection chemicals have experienced less growth.
- Research into biofuels has become increasingly important, with estimated global investments by private companies at approximately $1.47 billion in 2009.
- In both crop seed and animal breeding, biotechnology research was an important driver of consolidation in these industries.
- Private spending contributed to the overall growth in R&D for agricultural in the face of slowing or stagnant public R&D resources, but addressed a narrower set of research topics and input industries than publicly funded R&D.

- Public policies have a major influence on private-sector incentives to invest in agricultural research. Intellectual property protection, regulatory frameworks, and especially, public investments in basic science that opens up new technological opportunities, have been important drivers of the growth of private agricultural R&D.

More information: www.sciencemag.org/content/338/6110/1031.full

Provided by United States Department of Agriculture