

**The Economic Returns to U.S. Public Agricultural Research & Development****Situation:**

Public investments in agricultural Research & Development (R&D) are critical to maintaining agricultural productivity and global food security. Public expenditures on agricultural R&D in the United States were approximately \$5 billion in 2007, which represents a small portion of the total public spending on agriculture. Furthermore, investments in agricultural R&D have declined in recent decades, coupled with a shrinking share of total research funds devoted to farm productivity enhancing research. Public spending on agricultural research (adjusted for inflation) increased by an average of 4.99 percent per year from 1900-1970, 1.74 percent per year from 1970-1990, and 0.99 percent per year from 1990-2007. Furthermore, approximately 75 percent of State Agricultural Experiment Station (SAES) spending was oriented to farm productivity-enhancing research in 1975; however, by the year 2007 this share had fallen to 57 percent. The consequence of the decline in overall spending combined with a shrinking share of funds for productivity-enhancing research is a substantial decrease in the productivity of U.S. agriculture in recent decades. Productivity growth in U.S. agriculture averaged two percent per year from 1949-1990, compared to one percent per year from 1990-2007.

**Impact:**

The difference between productivity growth of one and two percent per year is substantial. For example, if productivity growth had been maintained at two percent per year from 1990–2007, we would have produced 18 percent more agricultural output in 2007 using the same input. The nominal value of U.S. agricultural output was \$281.5 billion in 2007, which could have been \$332.2 billion if agricultural output would have increased two percent per year. Recent studies also indicate that U.S. public investments in agricultural R&D generate a real rate-of-return of approximately 10 percent per year. This corresponds to a benefit-to-cost ratio of approximately 30 to 1, meaning we get \$30 in benefits for each dollar we spend on agricultural R&D. However, the main issue that must be confronted is the long time lag that exists between a given expenditure on R&D and the subsequent benefits. The estimated lag between a given R&D expenditure and a peak effect on agricultural productivity is approximately 20 to 25 years. Thus, it is imperative to act now to increase funding in agricultural R&D, and to sustain the funding increases in the long run.

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