

**RESEARCH LAGS REVISITED:  
CONCEPTS AND EVIDENCE FROM U.S. AGRICULTURE**

by

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**ABSTRACT**

Many researchers and commentators underestimate the length and importance of the time lags between initial research investment and ultimate impacts on the development and adoption of technological innovations. In both econometric studies of productivity and ex post and ex ante benefit-cost evaluations of research investments, researchers typically impose untested assumptions about the R&D lag, which can have profound implications for the results. In this paper we present a range of evidence on agricultural R&D lags including both aggregative analysis of U.S. agricultural productivity using time series data, and some specific details on the timelines for the research, development, and adoption processes for particular mechanical and biological innovations in U.S. agriculture. The aggregative analysis makes use of a comparatively rich state-level data set on U.S. agriculture that makes it possible to test hypotheses about the R&D lag and to evaluate the implications for the specification of models of production and for findings regarding the rate of return to public research investments. The results support the use of a longer lag with a different shape than is typically imposed in studies of industrial R&D. These findings are supported by the timelines for specific technological innovations, including new crop varieties, as well as tractors and other mechanical innovations.