The Seed Industry in U.S. Agriculture

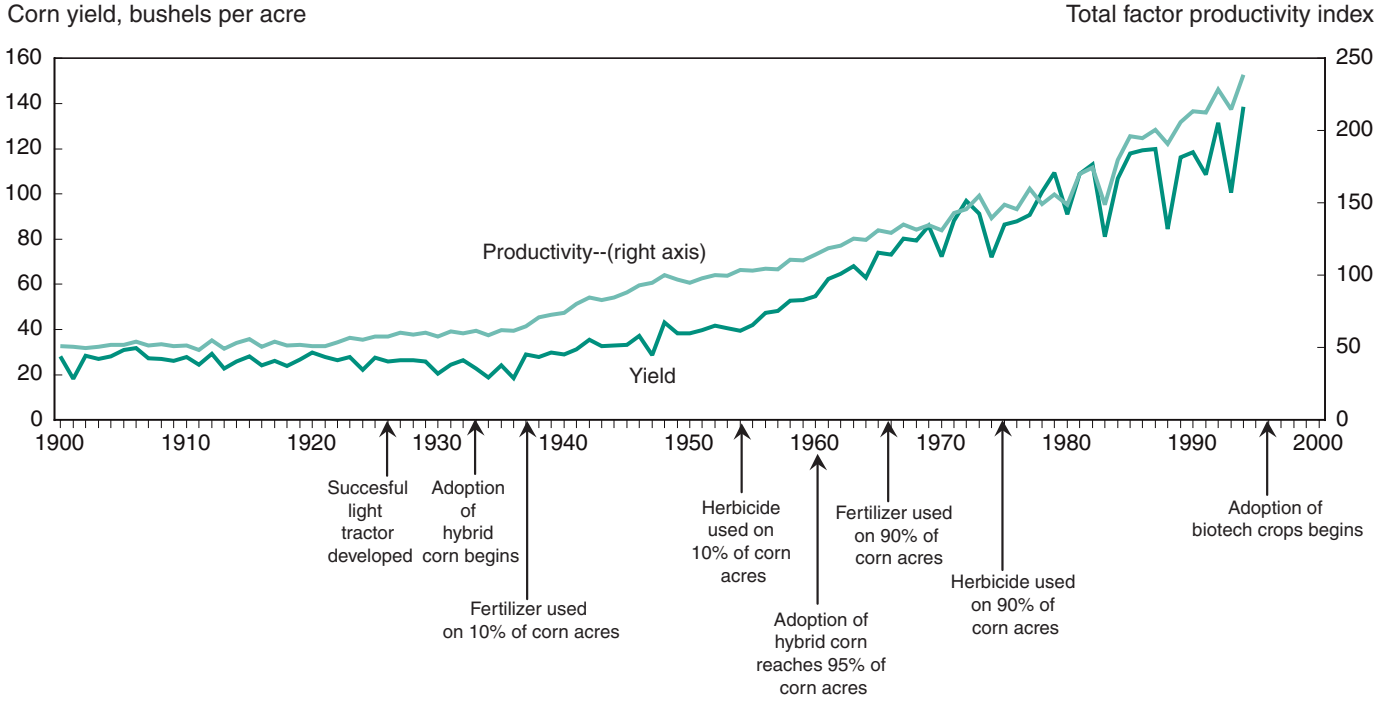
An Exploration of Data and Information on Crop Seed Markets, Regulation, Industry Structure, and Research and Development

Introduction

In 1798, Thomas Malthus predicted that geometric population growth and arithmetic food production increases would lead to chronic food shortages, with dire consequences for the future of humanity. Those predictions have failed to materialize largely because worldwide agricultural production has increased enough to accommodate a sixfold increase in population. In particular, the unprecedented growth in crop yields and agricultural total factor productivity (ratio of total outputs to total inputs) over the past 70 years owes much to a series of mechanical, chemical, and biological innovations driven by agricultural research and development (fig. 1).

To a large extent, these yield increases resulted from a series of biological innovations embodied in seeds. The first, and possibly most significant, innovation was the development of hybrid crops, particularly corn, in the United States in the 1930s. Improved varieties also raised yields in many other crops. Developing countries also adopted high-yielding crop varieties, spurring the Green Revolution of the 1960s and 1970s. More recently, modern biotechnology, especially genetic engineering, is facilitating the development of new biological innovations embodied in seed.

Figure 1
Corn yields and total factor productivity in U.S. agriculture



Source: Fernandez-Cornejo et al., 1999.