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**“Concentration and Monopolistic Competition in the
California Seed Industry: Implications for Agricultural
Biotechnology”**

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ABSTRACT

Over the last 30 years, the structure and conduct of the U.S. seed industry has changed dramatically. It was the intersection of the seed industry and advances in molecular biology that instigated the biotechnology revolution. Changes in intellectual property rights, consolidation through mergers, acquisitions and conglomeration, and the rapid advancement of biotechnology and transgenic plants have created an industry that is vastly different than it was 30 years ago, but has attempted to retain many of the more traditional values of the farming industry it has served for over 130 years.

California is known throughout the world as a premier location for crop breeding, variety development and seed production, particularly of horticultural crops and agronomic crops other than corn and soybeans. Its favorable climate and sophisticated infrastructure for growing, harvesting, processing and marketing of high quality seed contribute to California's position as a leader in the highly interconnected and complex global seed industry. The California Seed Industry constitutes approximately 10 - 15% of the activities of the U.S. seed industry and mirrors many of the trends within the entire global network of growers, processing facilities, distribution system, and research institutions.

This paper utilizes data that was collected from 1990 – 2002 to analyze the evolving structure of the California Seed Industry in achieving considerable economies of size, particularly in R&D activities. The data are analyzed in three dimensions. First, detailed information on seed specific production, harvested acreage, yield, unit price, and value are used to assess the economic performance and competitiveness of California's seed industry during the 1990s. Among other things, a farm to retail price spread for California seed during 1990-2002 is estimated, and the economic implications considered.

Second, a cross-sectional analysis is conducted on data obtained from the results of two seed industry surveys conducted in 2001 and 2002. The results provide a detailed look at the current value and structure of the industry. Industry concentration indexes and the vertical organization of the California seed industry are examined in detail.

Finally, a regression analysis of the data is used to reveal the significance of a number of variables that are important explanators of product differentiation, economies of size and the hypothesized presence of monopolistic competition.

Some of the issues this paper attempts to articulate are: 1) the importance of biotechnology R&D for the California seed industry, 2) the competitiveness of the California seed industry, 3) the relationships between firm size and expenditures on R&D, and 4) the importance of market and consumer research.