

## The Economic Stress in U.S. Agriculture

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Our ancestors came to the United States as poor people to an empty land. Since then, we have used and sometimes abused the land and become a rich people. In the process, however, we have taken few precautions to avoid becoming a poor people on a poor land. During 1985, 3.8% of our farms went bankrupt (compared with 0.7% in 1982) and another 4.8% stopped operations.

Fifty years ago, 25% of the U.S. population resided on farms. Today, about 30% of the U.S. work force is tied to agriculture but less than 3% of us live on farms and

ranches directly engaged in production agriculture. In spite of this small rural minority, sufficient food production is not a domestic problem. Our well-stocked supermarkets and relatively low food prices convey our abundance. On average, we still spend less than 25% of our incomes on food. Yet for the food producers in rural America on which we all depend, all is not well. For this group, yields are high but so are production costs. The domestic markets for the raw crop and livestock products they manufacture are largely saturated, and international markets are weak or nonexistent. The result is a produce market price that may not cover the cost of production. For 80% of our rural food producers today, the most profitable enterprises in which they engage are off the farm.

Today, the production of farm crops and livestock in the United States is capital-, chemical-, and credit-intensive. U.S. agricultural products are pesticide-, irrigation-, fertilizer-, machinery-, energy-, and labor-dependent. Furthermore, farm real estate has deflated to nearly one-half its 1981 level. Only a decade ago, farm credit and income were backed by inflating land values. Currently in the Northwest, 10 lb of onions costs approximately \$1.50 to produce and returns about \$1 at the market. Except for specialty packs, 100 lb of Idaho potatoes retails at about \$5 yet costs approximately \$3 to produce and \$2 to package and deliver. Northwest farmers invest \$2-3 and 5 bu of topsoil to produce 1 bu of wheat that sells for under \$4. Attempts to ease this kind of economic squeeze in the Northwest and elsewhere in the United States via government subsidies, price supports, and low-interest guaranteed loans did increase farm income initially. However, looking toward larger profits, producers of our major commodities stepped up production, which in turn saturated markets and/or further depressed commodity prices. This process is still at work in the dairy industry, for example, where milk volume continues to rise and the pounds of cheese acquired and then given away by the government have increased fivefold since 1980. Unlike milk, the annual production of U.S. wheat, a major export commodity, has been relatively stable. However, it too is in an oversupply as a result of depressed exports that have dropped to one-third the 1982 level.

Where has agricultural research or, more specifically, plant pathology fit into this circumstance? And how is it that the 3% on which the 100% of us depend—and which our land-grant universities are pledged to serve—is not in charge but instead is in a stressful economic slump?

Since World War II, agricultural research has been a product

of private industry, the USDA, and especially the state agricultural experiment stations. In that time, via research, we discovered how to "grow two blades of grass where one grew before." This was our research objective and we achieved it. Since 1978, for example, the acre tonnage of Idaho sugar beets has increased by 18% and sugar yield per acre is up 23%. Extra energy and new genetic inputs underlie this increase and similar production increases in many other U.S. farm commodities. By uncovering disease-resistant crop varieties and otherwise limiting disease stress, plant pathology contributed its part.

Thus, agricultural research generally, over the past 40 years, is responsible for our abundance. However, it did not act alone. As we applied the new production technologies that came from research, parallel changes occurred in consumer preferences, foreign competition, and our economic policies. Thus, research and policy together changed the scale and nature of our farms. Today, our farms are larger, more specialized, more inorganic, and fewer in number than those of our ancestors. Furthermore, it was the research-economic policy duo over the past 40 years that fueled production optimism (rather than productivity) and higher land values; fueled the use of energy, capital, chemicals, and credit; and, most important, fueled a dependence on export markets that unfortunately were incidental and open to competitors rather than tied to stable international agreements. We delivered an abundant supply of traditional products in response primarily to foreign production disasters and aid (not purchase) agreements. We paid little regard to product diversity, foreign competition, or consumer tastes. As a result, U.S. agriculture did not evolve as rapidly as consumer preferences, the value of our U.S. dollar, and foreign competition in food, feed, and fiber production.

We are entering 1986 with farm production still outpacing markets. Looking ahead, agricultural research and plant pathology are at a crossroads. A change is necessary. Some will argue to abandon science and research. After all, the production focus of agricultural research brought the abundance that now is a problem. I argue instead that research—and no less disciplines such as plant pathology—must continue if not be augmented. Research can address profitability on the farm and human well-being in a different light than heretofore. Our past efforts served us well and permitted us to meet our production objectives. We see now how each new agricultural technology was maneuvered by economic policy to benefit producers initially, agricultural support industries secondarily, and consumers ultimately. We see also that the U.S. consumer is now the primary—if not the sole—benefactor. Hereafter, research and economic policy (and perhaps domestic food prices) must evolve to correct this imbalance. Through the remainder of this century and into the next, plant pathology and all sciences supporting agriculture must address: 1) new agricultural products and new markets for their distribution, 2) production efficiency via reduced inputs and resource conservation, 3) consumer trends and needs domestically and internationally, and 4) human capital development, especially increased consumer awareness of quality and cost of U.S. farm products relative to our competition.

We are on a threshold with new objectives before us. We are entering the information age and a global economy. We are armed with computers, gene manipulation techniques, a fresh understanding of systems, and a working appreciation of integrated science and management to superimpose on our fundamental sciences. Producers and consumers in the United States may again be simultaneous and equivalent benefactors if we seriously apply these skills to agriculture in the years ahead. But, unlike in years past, this application must be beyond as well as within the farm gate.