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Productivity and production

The question is often asked, "Why should we continue to do research that increases agricultural production, when surpluses are already driving prices down and putting farmers out of business?"

This is a critical question, one which influences the attitudes of state and national government representatives and which could result in policies that, although well intended, could easily make the situation far worse for American farmers.

The key words are "productivity" and "production." As research develops new knowledge and technology, the output of the system per unit of input — its efficiency or productivity — increases. For example, a wilt-resistant variety of cotton developed through research for planting in the eastern San Joaquin Valley increased cotton yield from about 400 pounds per acre to 900 pounds per acre, with essentially the same fertilizer, pesticide, land preparation, harvesting, and labor costs. That is an increase in productivity. The change in the growth rate of hogs per unit of input is another example. A recent comparison showed that 33-pound pigs fed a 1907 diet for 60 days gained 7 pounds in 60 days; those on a 1983 diet gained 63 pounds, a nine-fold increase in productivity.

American farmers have been raised on the concept of increased productivity, and research in our land-grant and private universities has served this objective, providing new varieties, better rations, more efficient machinery, better pest control, improved soil and water management techniques. All have increased our productivity and helped make our agriculture profitable.

The problem arises when we look at the other side of the equation — the production side. When productivity improves and the number of production units remains the same, production increases. If, for instance, we went from 400 to 900 pounds of cotton per acre and continued to produce cotton on the same number of acres, we most assuredly would have a major increase in total production. That is a management decision that every farm manager must make every year: how many units of a particular commodity to produce. In other words, what is the market demand for cotton or hogs?

In the past, the demand always seemed to be there; we always seemed to be filling a bucket that was only partly full. But American agriculture has become more dependent upon an export market where it competes with agricultural commodities from all over the world. We now find that the market for a given commodity can become saturated, or the American com-

modity may not be competitive on an international market because of its high price, the high value of the dollar, or whatever cost factor regulates its final value. The interaction between productivity and production then becomes crucial.

If the American product cannot compete on the international market at its present price, one way to make it competitive is to increase productivity so that the commodity can be sold for less. That is exactly what the new developments in biotechnology are allowing us to do. We're told, for example, that by the year 2000, genetically engineered bovine hormones have the potential to double the milk produced per cow. Obviously, this would have a major impact on the U.S. dairy industry — indeed, on the worldwide dairy industry.

Now more than ever, the production manager must make well-informed decisions so that the equation for productivity times units produced will result in a level of production that is both adequate and profitable. This is without a doubt one of the toughest issues facing the American farmer today.

It's easy enough to say that the production manager must make these decisions, but how? Are the tools available to analyze production needs? Are industry structures available to enable growers to adjust production when it is in their best interests to do so?

The researcher and extension specialist must develop the knowledge, technology, and educational system to give farmers the means to make better decisions about their production. State and federal policymakers must assist in providing essential information on foreign markets and on foreign and local production, and must provide policies that help commodity organizations to do an overall assessment and self-regulation of production. The problem is not a simple or local one. Even when the production manager recognizes the need to decrease production of cotton on a particular farm, if the neighbor doubles his or her acreage, nothing is gained. It will take a cooperative and coordinated effort among farmers not only to evaluate the situation but to make the appropriate decisions on a commodity-wide basis.

The equation of productivity vs. production cannot be denied. Research-based increases in productivity are essential for profit, and profit can be expanded or decreased depending upon how productivity is used. Increased efficiency will keep the American farmer at the forefront if the economic and policy tools are available and utilized to balance the equation.